TEAMSPEAK 2 BASICS

1. Introduction

TeamSpeak 2 is the unique bi directional audio communication software allowed in IVAO Network.
TeamSpeak 2 simulates an aircraft or ATC radio transceiver.

TeamSpeak 3 is not compatible with current network and audio architecture.
Do not use TeamSpeak 3!

This document outlines TeamSpeak 2 procedures.

2. Use in IVAO

This Software can be used:

- As a pilot to speak with ATC when flying online
- As an ATC to speak with pilots flying in your airspace
- As an observer to listen to ATC and pilots in an ATC channel
- As a trainer or examiner to conduct training and examination
- As a staff member to communicate with all the members (staff or regular member)
- As a pilot to speak with your Virtual airline pilots

3. Equipment need

When using TeamSpeak, you need some basic equipment along with your computer:

- Headset equipped with microphone (using USB or Audio connectors)
- Headset with separate microphone
- Speaker with separate microphone

IVAO procedures recommend the use of a basic headset with an integrated microphone in order to keep hands free for flying or controlling.

4. Download

The last version of IvAp and IvAc will automatically install TeamSpeak 2. Use this method as regular installation of IVAO software.

For x-IvAp users or for people who have any problems with TeamSpeak 2 installation, you can **download TeamSpeak 2 software for free** using the link from the IVAO website:

5. Connection to a server

5.1. IVAO Server list

The table presented will show you some of the possible network server names

server name	Server address name
Europe n°4	Eu4.ts.ivao.aero
Europe n°6	Eu6.ts.ivao.aero
Europe n°8	Eu8.ts.ivao.aero
Europe n°14	Eu14.ts.ivao.aero
Community Channel	cc.ts.ivao.aero

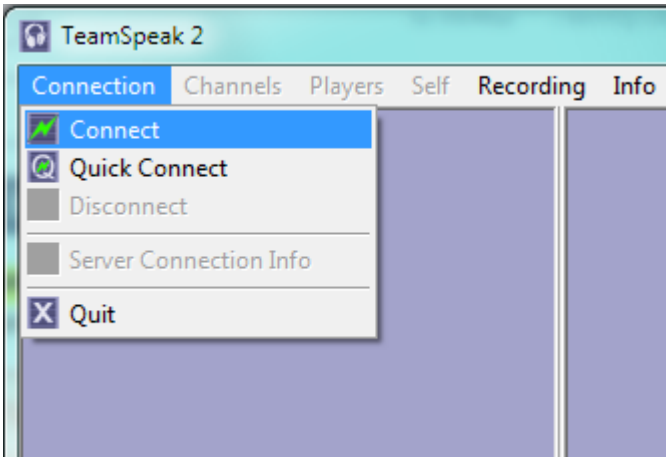
Be aware that this list can change when some servers open or others close.
List can be found on : http://ts.ivao.aero

The community channel server (cc.ts) is the server that you must use when you want to chat with other members when not making use of ATC services (example: private chat, virtual airline specific channel to meet friends, staff meeting, and examination meeting …).

5.2. Connect a server manually

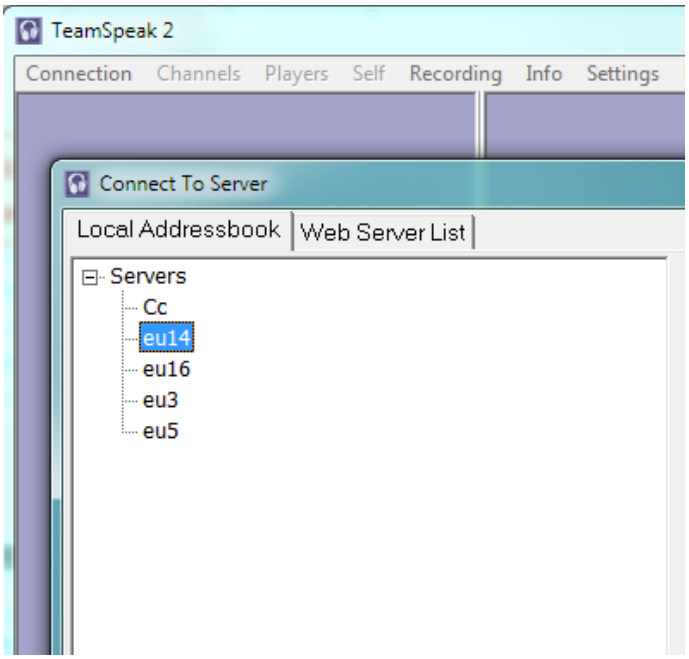
In order to connect a server manually:

- Open **TeamSpeak 2**
- Select **Connection** tab
- Click on "**Connect**"



Then a separate window named "connect to server" opens.

- If you have some servers already programmed, **double click on the chosen server to connect it**.

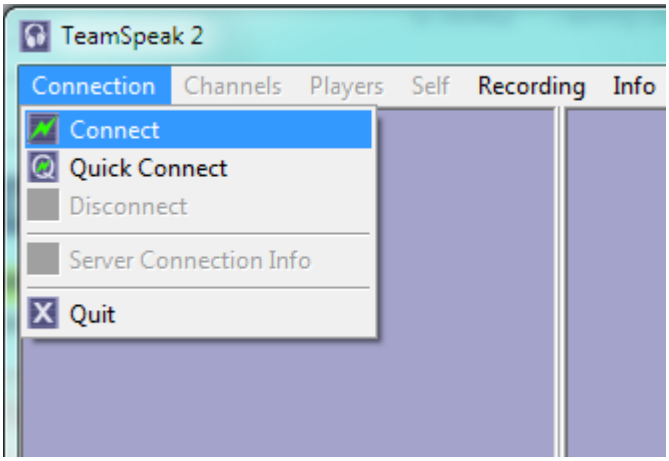


If the server list is empty, please follow the server adding procedure

5.3. Server adding procedure

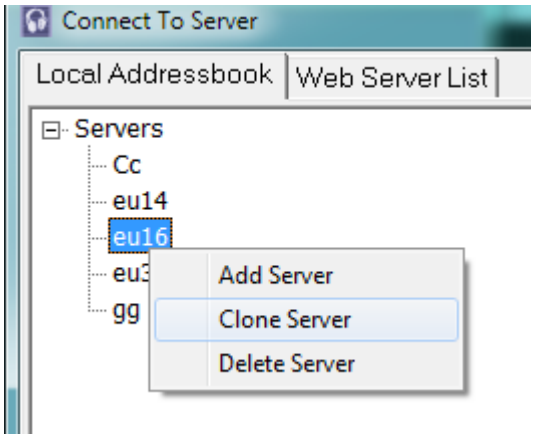
In order to add a server manually to the list, follow the procedure for each server:

- Open **TeamSpeak 2**
- Left-click **Connection** tab
- Left-click "**Connect**"



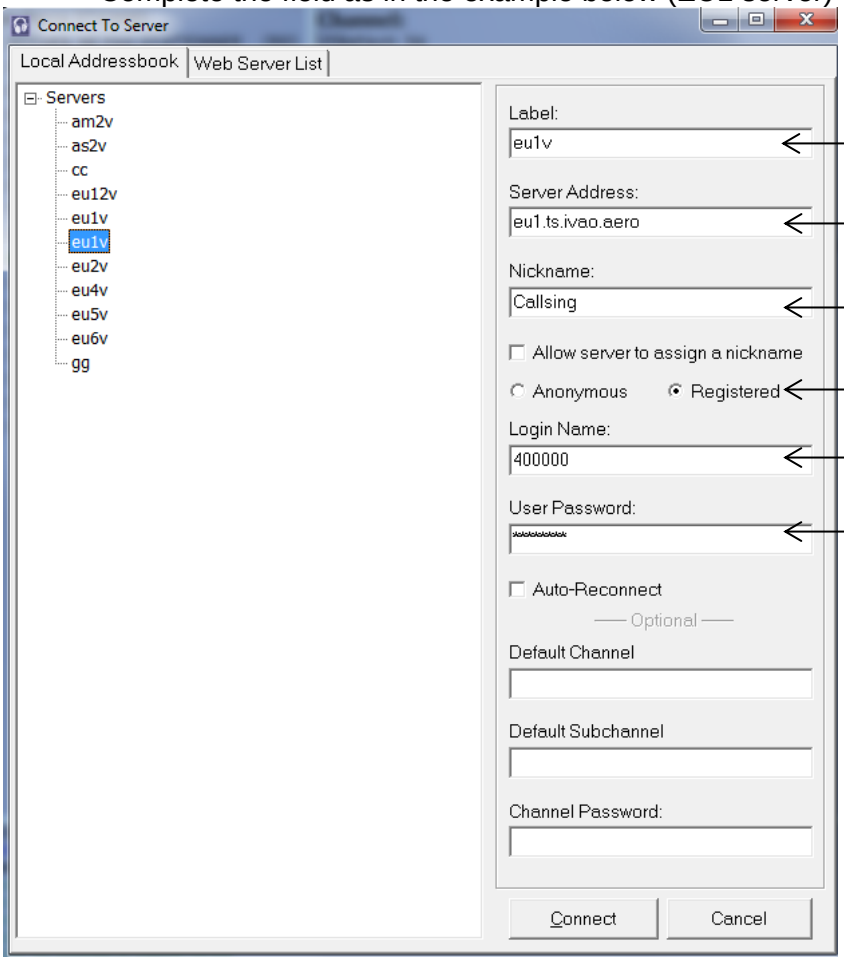
Then a separate window named “connect to server” opens.

- Right-click on “**Servers**” as in the image
- Left-click on “**Add Server**”



A new server name “New Server” is created in the list, then:

- Left-click on “**New Server**” in order to edit and assign an appropriate name.
- Complete the field as in the example below (EU1 server)



Personal name of server

IVAO Server Address Name

Your connected **callsign**

Tick the registered button

Your **VID**

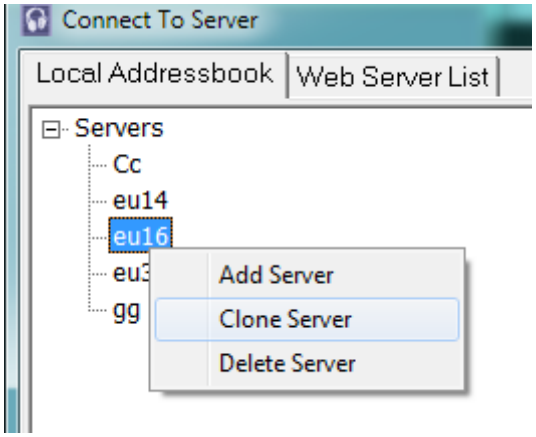
Your **IVAN** password

After completing all the fields, click on the “**Connect”** button to test your new server.

5.4. Server cloning procedure

After your first server is set, you can clone this server in order to duplicate servers and assign new names and servers.

After duplicating your server, just edit and **modify the Label name and the server Name** in order to set up a new server.



This procedure is the easiest to program another server without typing your VID and Password.
Of course, if you made too many duplicate servers, you can delete some using the Delete server command.

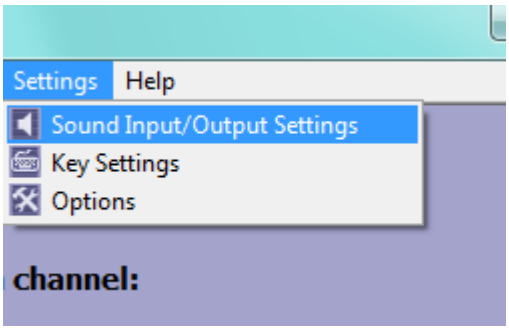
6. TeamSpeak 2 basic configuration

6.1. Push to talk set-up

In order to avoid unknown noises on a frequency, you must use the push-to-talk (PTT) setup and configure an associated key to use for radio transmission.

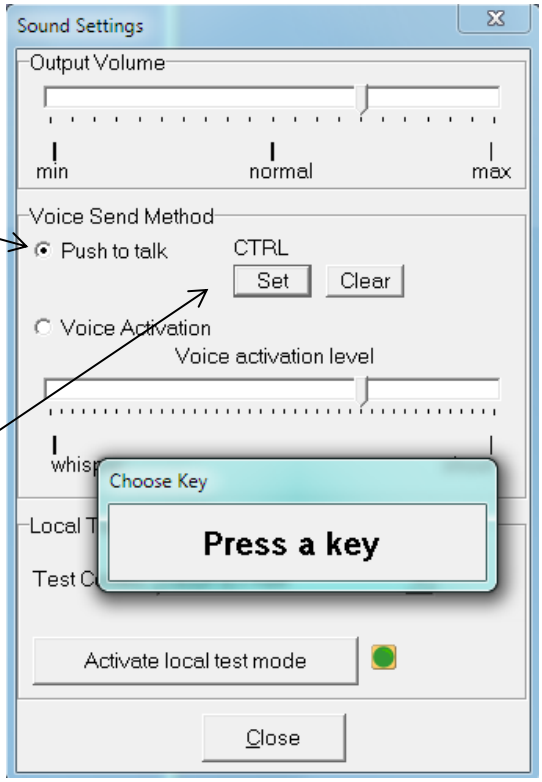
In order to configure your PTT key:

- Open **TeamSpeak 2**
- Select **Setting** tab
- Click on "**Sound Input/Output Settings**"



A new sub window "**Sound Settings**" opens:

- Select "**Push to talk**" radio button



- Left-click on the "**Set**" button in order to define the transmission key (utilize an unused key on your keyboard).

This key you have defined must be pressed before you speak and must be released after you have finished speaking. Pay careful attention not to release the key as you speak the last word, but *after* the last word.

It is very important to select an unused key (key like CTRL, SHIFT, ALT, ALTGR)

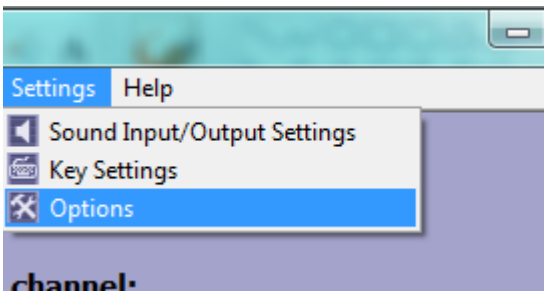
Our advice is to ***not*** use the 'voice activation' feature in TS on IVAO due to external sounds which can automatically activate transmission.
In the real world, there is no voice activation when flying!

6.2. Remove all automatic sound notifications

In order not to be disturbed by automatic sound notifications, we advise you to suppress them all.

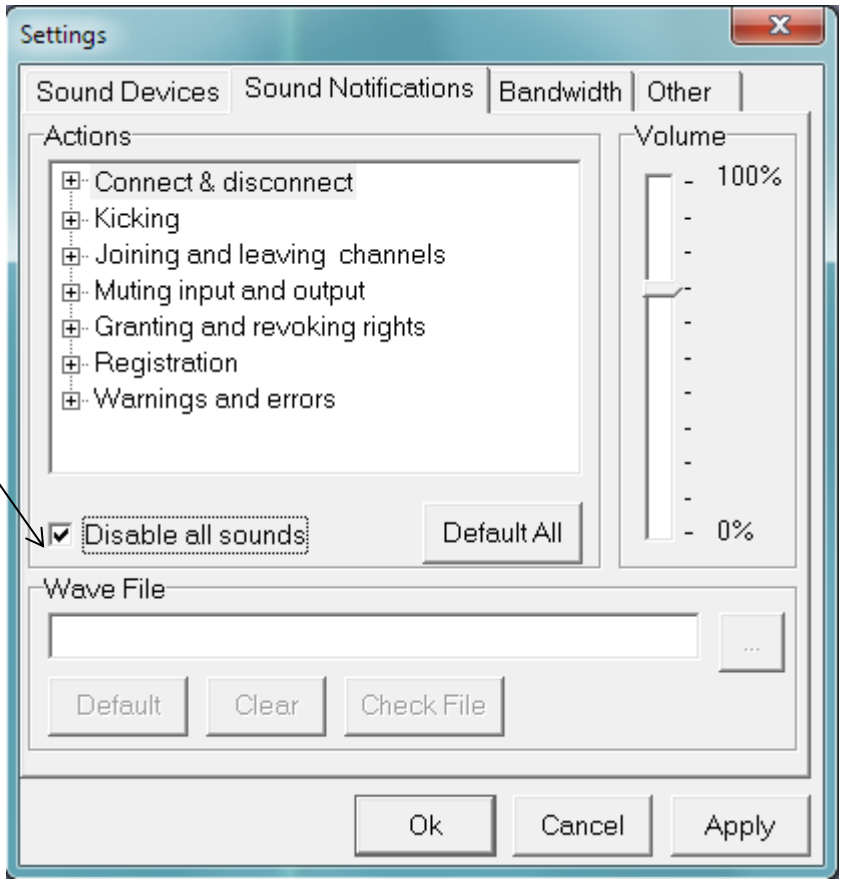
In order to disable sound notifications:

- Open **TeamSpeak 2**
- Select **Setting** tab
- Click on "**Options"**



A new sub-window "**Settings**" opens:

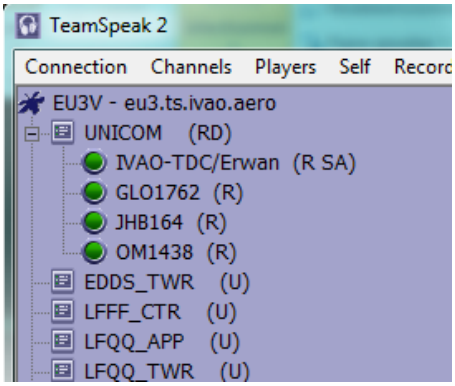
- Select "**Sound Notifications**" tab
- Check the "**Disable all sounds**" box



For advanced users, with this tab, you can select the notifications you wish to program, suppress or modify. **For beginners, we advise you to disable all sounds**.

7. Server internal structure presentation

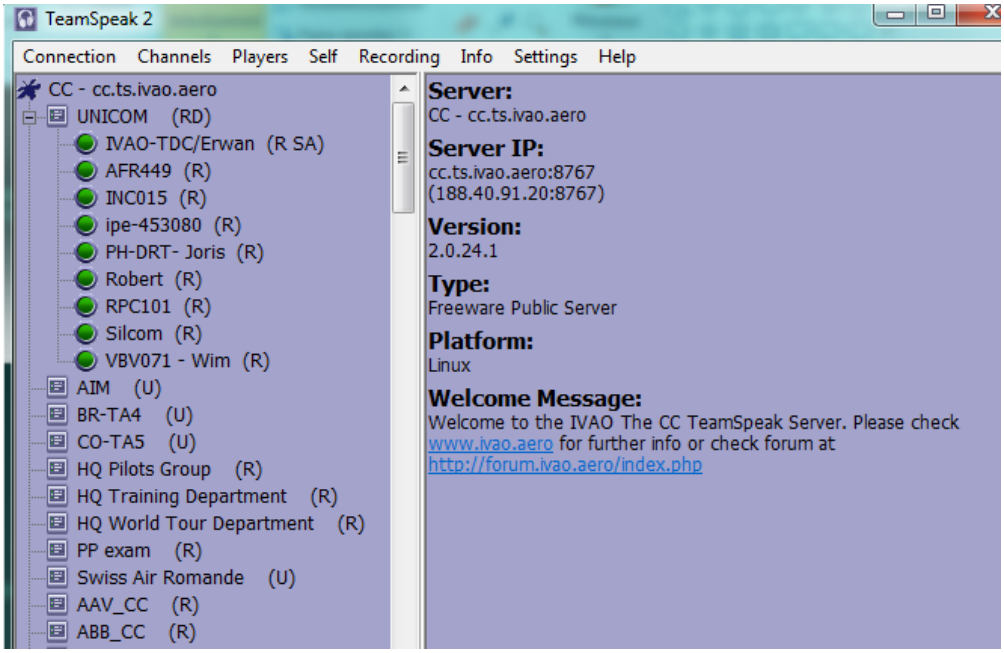
Each server has several channels where ATCs and pilots communicate.
When connecting manually to a server, you are automatically placed in a channel called “Unicom”.



This “Unicom” channel is a standby channel. *No radio communication shall be done in this default channel*. This is not a voice self-information channel.

Except in the “Community Server” channel, each open channel is opened by an active ATC.

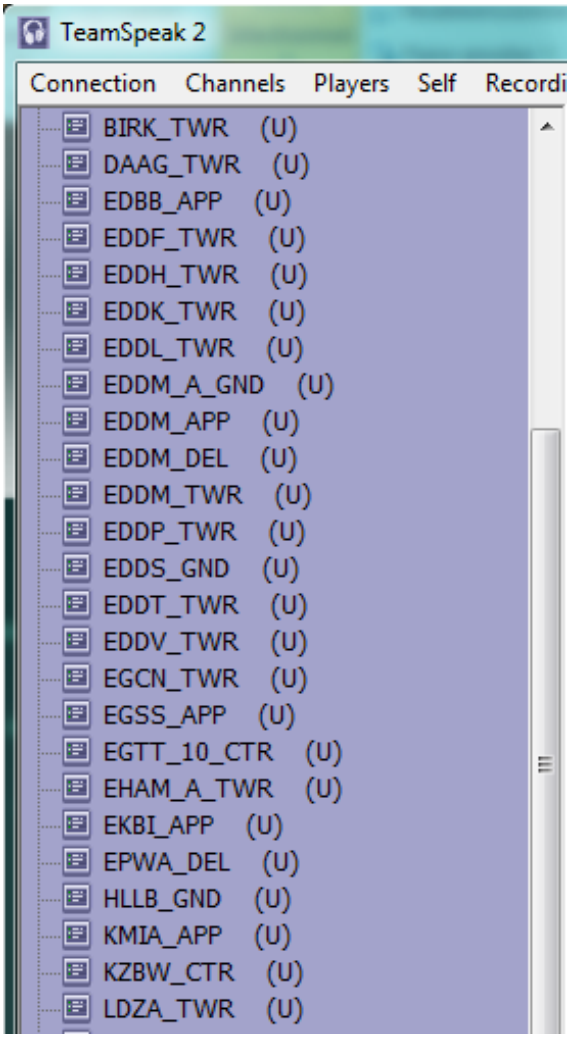
Below, you will find the connection on the community server.



In the **community channel server, some channel access may be restricted** for private examinations, training, staff meetings, and virtual airline meetings use. Please consult the channel description on the left before entering.

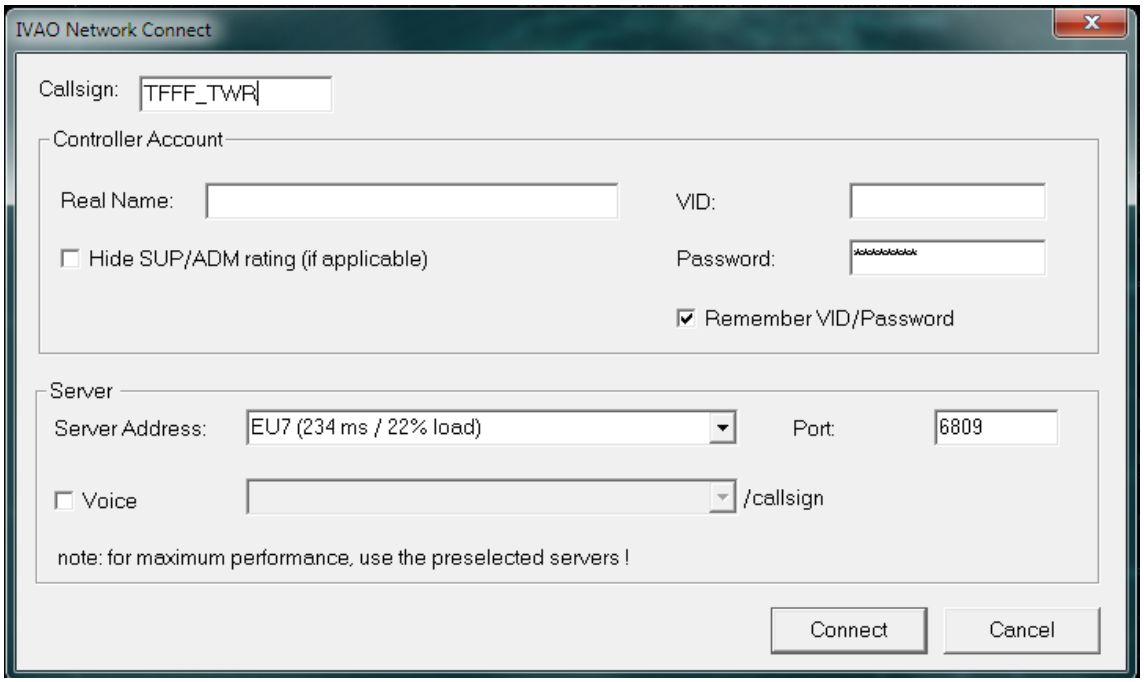
Each channel shall have the connection name of the active ATC inside

This name is made up of the ICAO code of the airport or controlled zone, followed by the position trigram (DEL, GND, TWR, DEP, APP, CTR, FSS).



8. Use of TeamSpeak as an Air Traffic Controller (ATC)

When connecting to IvAc, you must select the Voice option in order to activate voice communication for the ATC service you are going to provide.



IVAO policy recommends to all the use of voice communications due to the heightened sense of realism (we try to be as real as it gets).

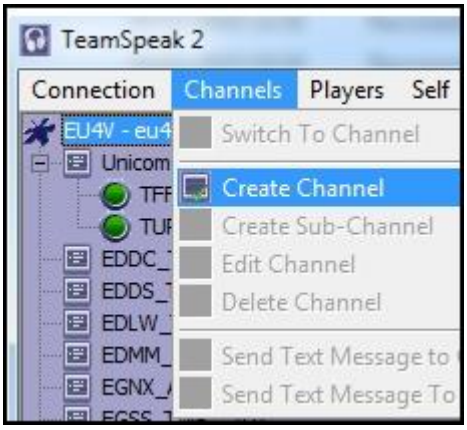
8.1. Connection

After IvAc has connected, TeamSpeak is automatically launched on the selected server.

Be aware that IvAc and TeamSpeak cannot automatically create your ATC channel. You must create it.

8.2. Channel creation

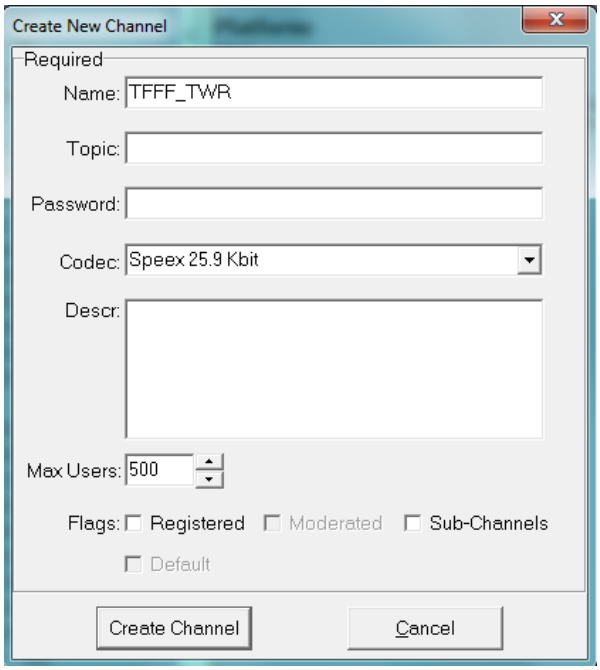
Select "**Channels**" menu and left-click on "**Create Channel**"



Then, a sub-window "**Create New Channel**" opens.

In that window, type the name of your position which is the same as your IvAc call sign.

Then left-click "**create channel**" in order to create it on the server



The use of the same IvAc call sign, as used for the ATC position you will be manning, for the TeamSpeak channel is mandatory.
If these names are not the same, pilots would not be able to automatically connect to your voice channel on the server.

After channel creation, you will find yourself located in the new channel with channel rights (CA) given automatically.

Now you can start to control using voice.

Be aware that if you change your call sign on IvAc after a network disconnection and controlling the same position, you must rename your channel according to the new call sign.

If you change your position in IvAc, you must close the position and advise the pilots that you are leaving this position. Then you can rename with [closed] comment in the channel name and leave this channel in order to create the new position channel.

9. Use of TeamSpeak as a pilot

9.1. Transmission mode selection in IvAp

When you want to use voice communications as a pilot (highly recommended), you must select the Transmit/Receive option in IvAp.

IVAO policy recommends to all the use of voice communications due to the heightened sense of realism (try to be as real as it gets).

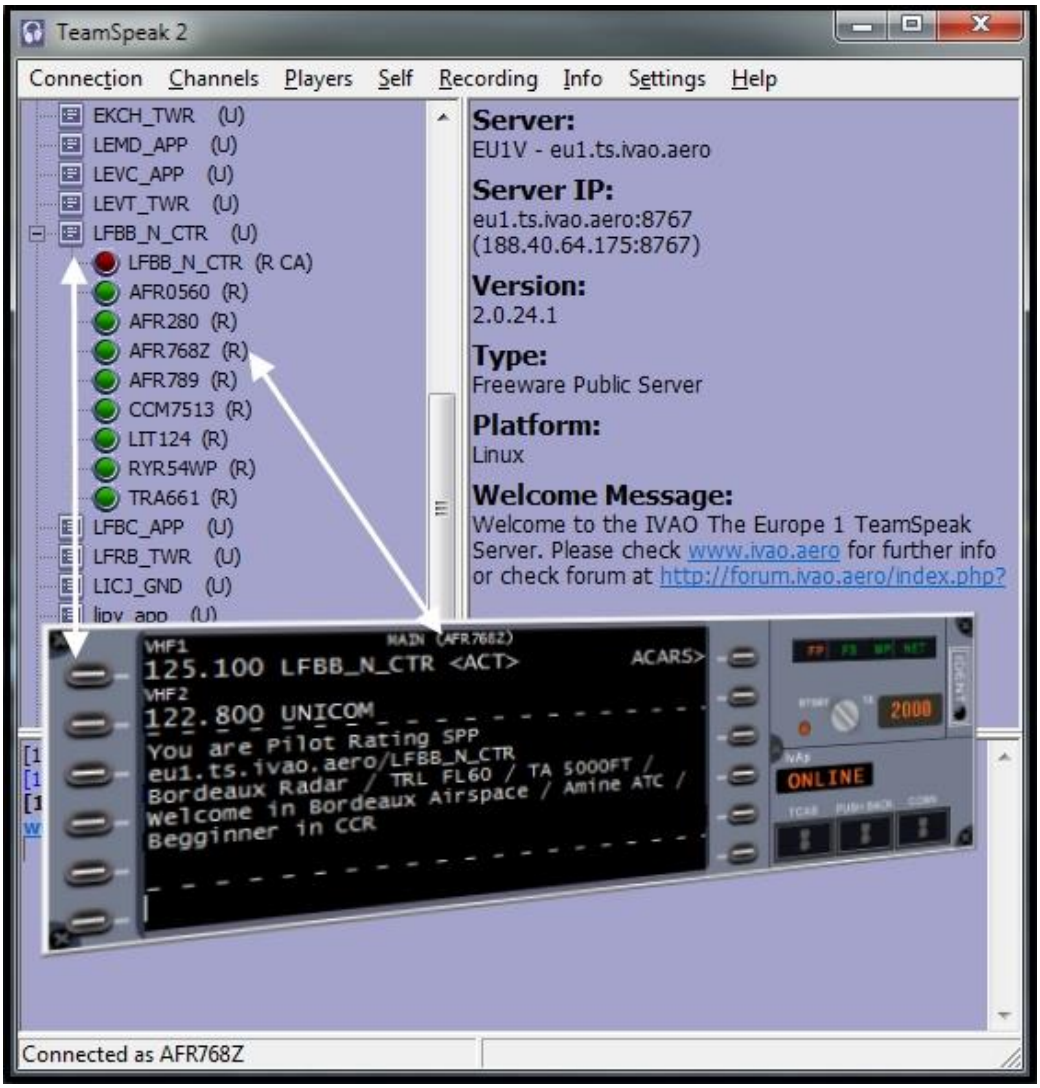
Some pilots can receive audio communications only and for some reason, they may not be able to speak (ex: baby asleep). In this case, it is highly recommended to select ”Receive (listen) Only” in spite of No voice. As a pilot you must know that text communication slows down the ATC efficiency.
The “No voice” mode is the historical text mode.
This mode can be used for a pilot who cannot speak (handicap) or they cannot understand spoken English. Of course, when using this mode, you must be able to communicate using basic written English.

When using text mode, the “read back” procedure is also mandatory.

9.2. Automatic switching with IvAp

When you select an ATC in order to contact with him on IvAp, IvAp sends the connection command to TeamSpeak 2 using Air Traffic Controller server parameters stored in his ATIS.

Your **call sign will automatically be taken from IvAp** and TeamSpeak will put you directly on the correct server and channel (if the ATC has correctly programmed his ATIS and TeamSpeak channel).



After listening to the channel activity for a short period, you may contact the ATC when no one else is communicating.

As there are often many pilots on an ATC frequency, please be patient and listen to ATC, other pilots and always speak after the read-back from any pilot. Be respectful.

BASIC IVAP FUNCTIONS FOR FS

1. Introduction

In this document, you will be instructed how to use IvAp (IVAOs' pilots tool) properly. This is just a short overview of the basics required for the PP exam.

Pay attention that this document is designed using an IvAp version which works only with FS9, FSX or Prepar3d simulators.

For a full explanation and list of all commands and functions, and for any further setup instructions, please refer to the latest IvAp manual.

2. General IvAp windows layout

In the picture above you can see the pilots' client after start-up - version 1.9.8.

By clicking on the button next to MAIN>, you will find the main display that is used for several entries and output. By clicking MAIN> again, you are back to the first menu.

The screen you are looking at can be divided into several parts:

- Part which includes the command buttons next to the black screen, 6 each per side. [RED]
- Part which includes the dialog box written in white with black background [YELLOW]
- Part which includes the status LED [BLUE]
- Part which includes transponder information [VIOLET]
- Part which includes the action buttons and online/offline status [GREEN]

2.1. Status lights

On the right hand side of the client, four status lights providing information about important factors can be found:

- **FP status light:** it is red when no flight plan has been sent and will turn grey once the flight plan is sent.
- **FS status light:** it is green when the connection between IvAp and Flight Simulator is successful and red if it is not.
- **MP status light:** it is green when the multiplayer connection to FS is successful and red if it is not.
- **NET status light:** it is green if the connection between IvAp and the internal message broker is successful and red if it is not.

2.2. Transponder

Below the status lights is the transponder section which includes:

- A **switch** to toggle its status from **standby** (“STBY” and red light spot) to **active** (“TX” and green light spot).
- **Four digits black window** indicating *your present squawk code*.
- The **IDENT** button must only be used after ATC has instructed you to do so. This function makes your target flash on the radar of the controller’s radar screen. ATC will instruct a pilot to click that button when using the phrase “*SQUAWK IDENT”*.

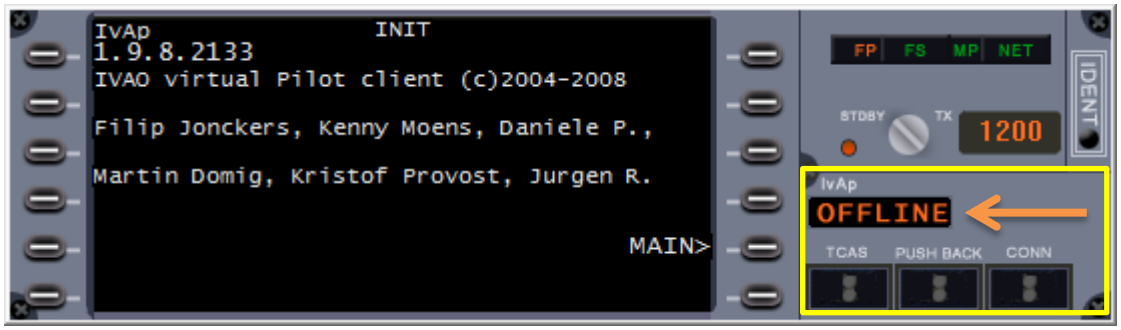
Be aware that when flying, you must set this toggle switch to:

- Position STBY (red light spot) when you are on the apron or on taxiways (taxiing, on gate)
- Position TX (green light spot) when you are on the runway and flying

2.3. Action buttons and online/offline status

In the bottom right of the IvAp windows, there are three action buttons:

- **TCAS button:** TCAS stands for **Traffic Collision Avoidance System**. By clicking on the button, a new small window opens, simulating a TCAS window.
- **PUSH BACK button:** This tool simulates an **aircraft tug**. By clicking on the button, a new small window opens showing the pushback tool. Using this tool, the aeroplane can be pushed-back and turned onto the taxiway.
- **CONN button:** used to **connect to** or **disconnect from** the IVAO Network (called IVAN).



Above these three buttons there is a black window that shows the status of the connection in the IVAO Network. There are only two possibilities **ONLINE** or **OFFLINE**.

3. Dialog Box Layout and Command Buttons

This display shown is the MAIN page of the IvAp window.

3.1. The upper part

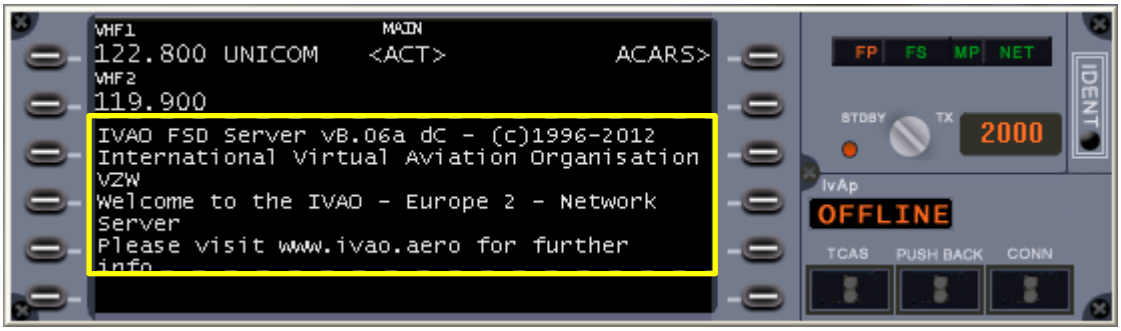
The upper part includes:

- 2 VHF frequencies VHF1 and VHF2
- <ACT> indication which frequency is currently active
- ACARS> button that leads you into another menu (see next chapters)

3.2. The middle part

The middle part between the two dashed lines is a log and chat window for several messages, such as:

- Text radio communications from a pilot or an ATC
- controller requests to contact him
- UNICOM message
- Server and Broadcast Messages for all members



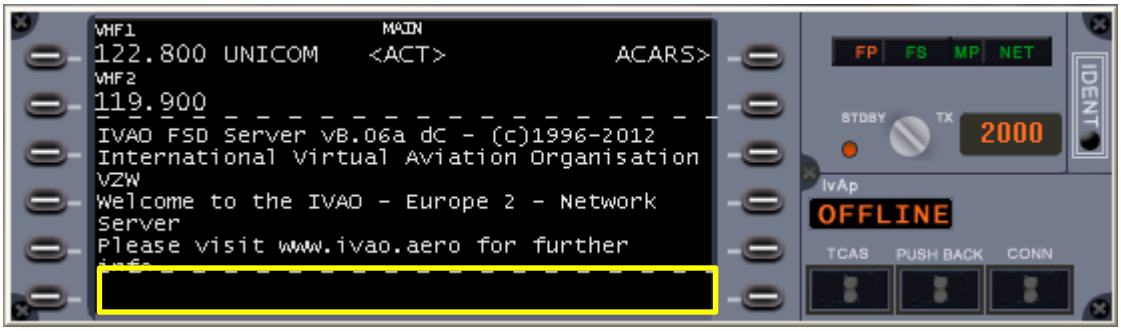
All messages displayed in red are private chat messages. They do not originate from any frequency.

3.3. The lower part

The lower part is an input area for text, also called the 'scratchpad'.

There are many possibilities to use this area:

- Interact on frequency by typing your messages.
- Interact with software by using text commands. These commands are initiated by using a dot **"."**, followed by the command letter, then your message



Be aware that your call sign is automatically inserted before your message by IvAp.

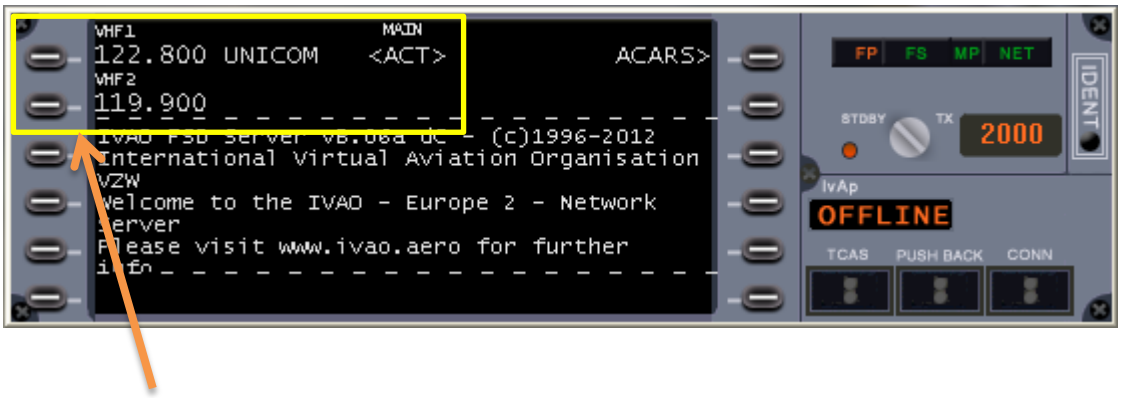
Here are the most important and most used commands for the IVAP scratchpad:

- **Send a private message:** *.msg <callsign> <message>* or *.m <callsign> <message>*
- **Reply to last private message:** *.reply <message>* or *.r <message>*
- **Open a chat window:** *.chat <callsign>* or *.chat*
- **Resend flight plan:** *.fpl* or *.f*
- **Set frequency on active COM radio:** *.c <frequency>*
- **Change transponder code:** *.x* <4 digit *squawk code*>
- **Request METAR of an airport:** *.wx <ICAOcode>* or *.w <ICAOcode>*
- **Request ATIS of an ATC unit:** *.atis <ATCunit>* or *.a <ATCunit>*
- **Show active ATC list:** *.atc*
- **Refresh weather:** *.rw*
- **Inform all online supervisors:** *.wallop <message>*
- **Disable voice (while connected):** *.novoice*
- **Enable voice (while connected):** *.voice*
- **Switch to receive only-voice (while connected):** *.recvvoice*

4. Radio Functions

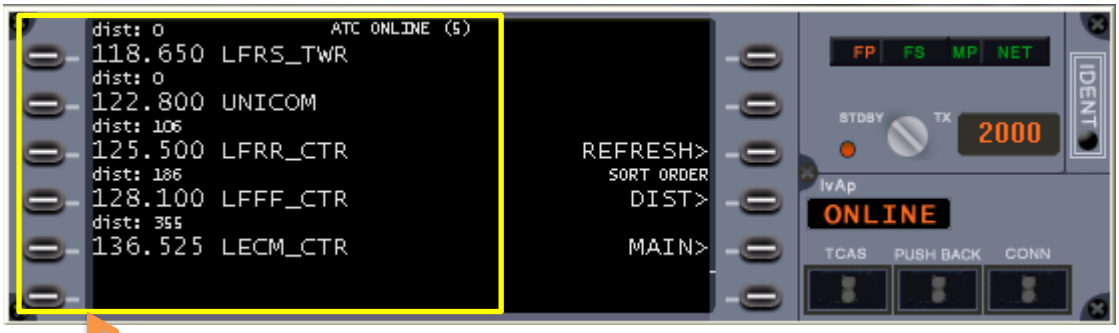
On the MAIN IvAp window, you will find radio communication buttons and relevant feedback:

- There are 2 VHF frequencies. One active and one Stand-by. The active frequency is indicated with the <ACT> active sign.



If you **left click on the button with your mouse**, you can change the active frequency from VHF1 to VHF2.

If you **right click on the button with your mouse**, you can change the frequency value using the ATC ONLINE selection window.

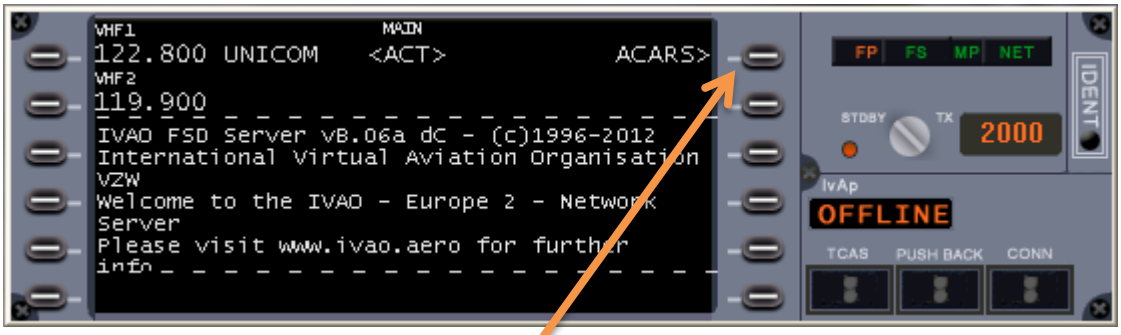


If you **left click on the button with your mouse** in front of the chosen ATC position and frequency, the frequency is changed **automatically in the VHF channel** in the MAIN panel.

5. Sub Menus ACARS

Definition: ACARS is Aircraft Communication Addressing and Reporting System.

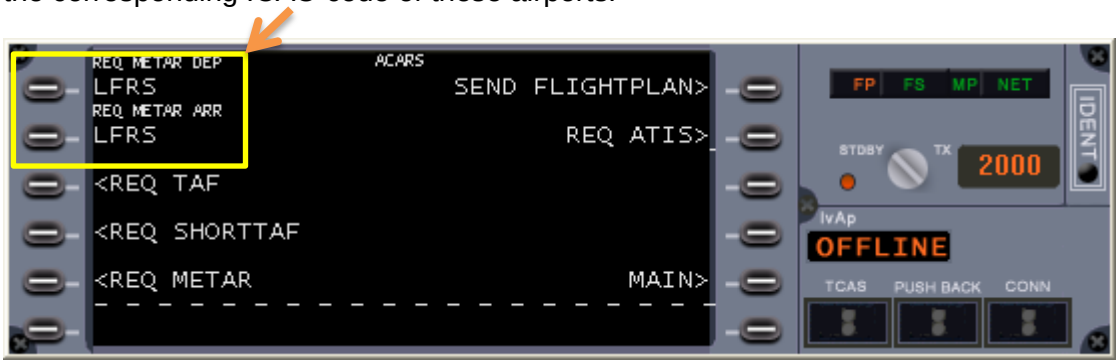
5.1. Enter in ACARS page



By clicking on the button next to ACARS> in the MAIN screen, a new menu with several options appears:

5.2. Get METAR and TAF information

You can obtain your departure and arrival airports' METAR by clicking on the first or second button next to the corresponding ICAO code of these airports.



Another method is:

- Insert one ICAO airfield code into the scratchpad (example: KJFK)
- Click the proper <REQ button. Then, you will receive a TAF, SHORTTAF or a METAR.

Pay attention that TAF and SHORTTAF are available only at some large airfields.

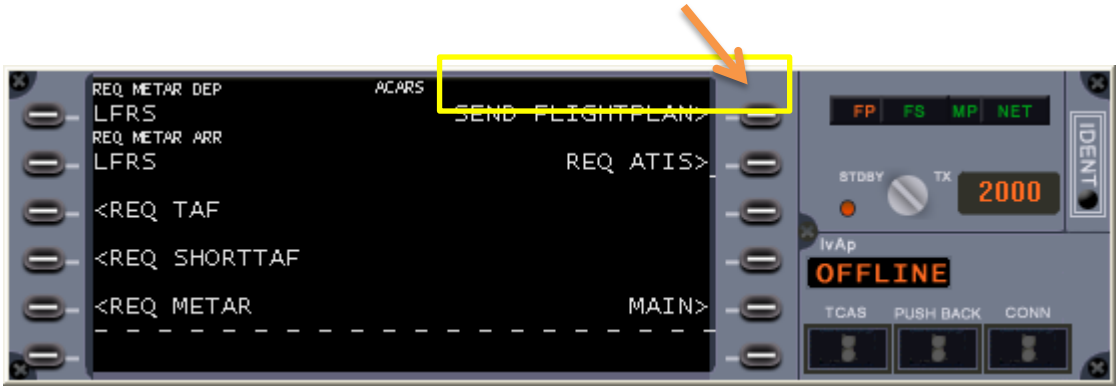
5.3. Get the ATIS from an active ATC

You can get the ATIS from an active ATC position:

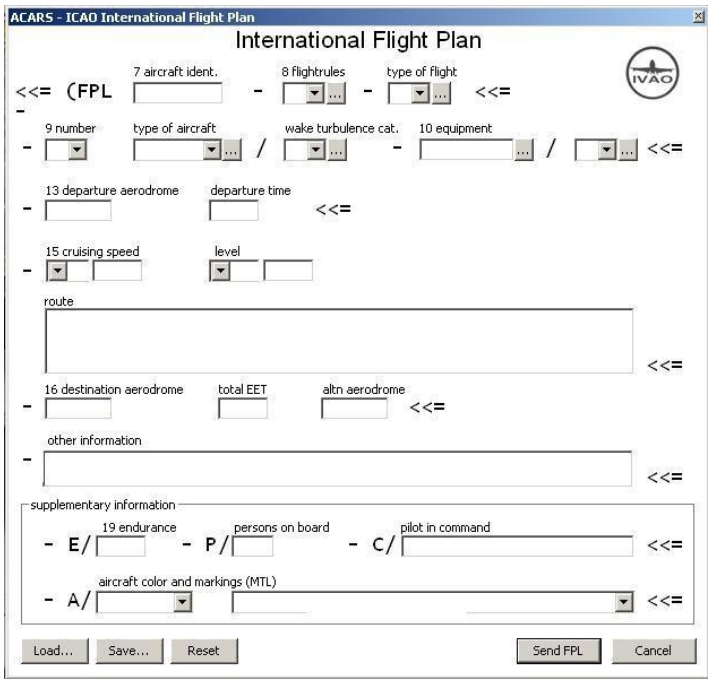
- Insert one active ATC position into the scratchpad (example EDDF_TWR)
- Click the REQ ATIS> button

5.4. Send Flight plan

The SEND FLIGHTPLAN> button will open a new window in which the flight plan must be completed.



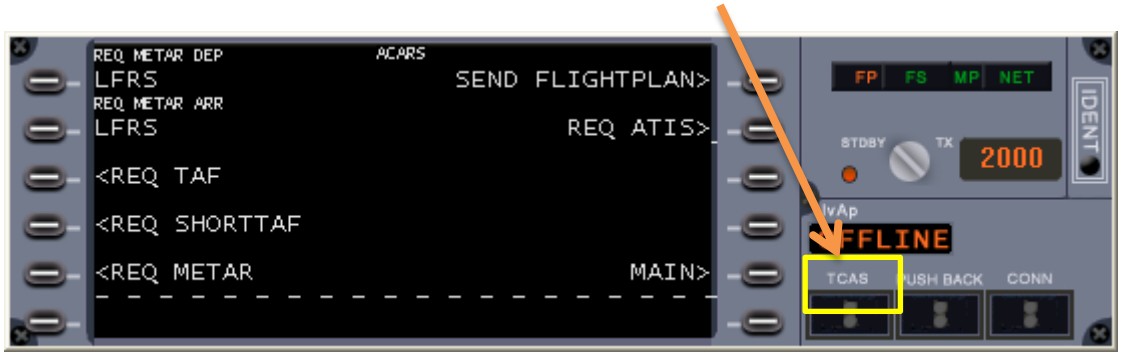
The figure below shows an empty flight plan to fill (consult the flight plan documentation for further details).



6. TCAS module

A traffic collision avoidance system or traffic alert and collision avoidance system, both abbreviated as TCAS (pronounced tee-kas), is an aircraft collision avoidance system which monitors the airspace around an aircraft for other aircraft equipped with a corresponding active transponder, independent of air traffic control, and warns pilots of the presence of other transponder-equipped aircraft which may present a threat of mid-air collision.

In IvAp, TCAS can be activated using the TCAS button on the interface



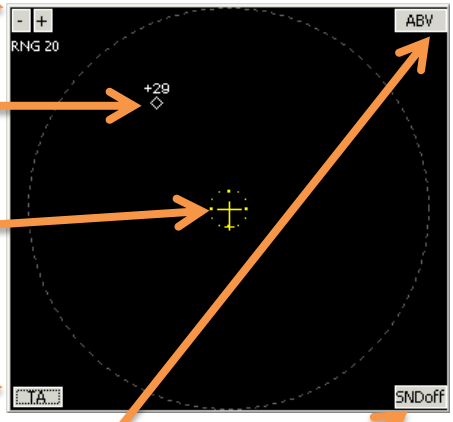
A new window opens and shows a deactivated TCAS with message "**TCAS OFF**" like the image below. In this window, there are 4 button activation zones where the user can click using the mouse in order to change TCAS parameters highlighted in the picture below with orange rectangles/

This zone can change the horizontal range of the TCAS.
Possible values are: 3, 5, 10, 20 or 40 NM

This representation shows traffic in range.
The value is the difference in altitude divided by 100
(+ is above – is below)

The representation of your aircraft position is the yellow symbol in the middle.

This zone can change the state of the TCAS system:
STBY=OFF, **TA**=ON (traffic advisory), **RA**=ON (resolution advisory)



This zone can change the vertical visibility range of the TCAS.
Possible values are: ALL, NORM, BLW, ABV
NORM= all traffic from your current altitude ± 2700ft is displayed
ALL = all traffic is displayed
ABV = all traffic from your current altitude -2700ft to +9000ft is displayed
BLW = all traffic from your current altitude -9000ft to +2700ft is displayed

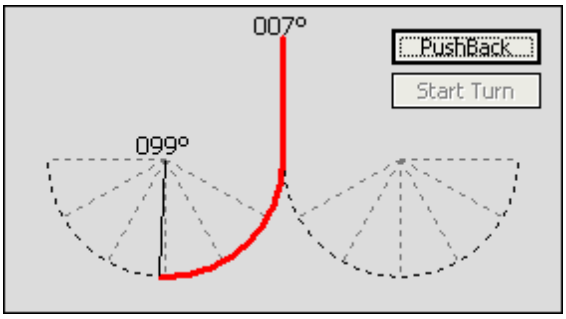
This zone can change the sound STATUS, sound ON or OFF.

7. Push back module

In the IvAp interface you can find a simple push-back tool.

In the IvAp window, the Push-back module can be activated using the PUSH-BACK button on the interface

A new window opens and shows:



- Click on a position angle on one of the half circles shown.
- To start the push back operation, release the brakes and click on the « Push back » button.
- Pushback now starts.
- If you want to start the turn, you must click on the « start turn » button.
- Push back will end when you click on « pushback » button or you apply the brakes.

GENERAL RULES AND REGULATIONS

1. Registration

4.1.1 - The use of IVAO™ and IVAN services is reserved for registered users.

4.1.2 - Anyone wishing to join IVAO™ may register at www.ivao.aero to become a "normal member." A normal member will receive a user ID and password to connect to the network.

4.1.3a - Each individual person is only allowed to have one registered account.

4.1.3b - Each organization is allowed to have one registered account subject to regulations detailed in 4.7.

4.1.4 - Membership registration must contain the member's real first and last name. A false user name will result in the account being removed.

4.1.5 - To remain as an active member of IVAO, members must logon as a pilot or ATC at least once every three (3) months. Observer connections do not count towards this requirement. Accounts with no activity will be removed after nine (9) months from the date of registration. If a member's account becomes inactive or has been removed, the member may contact the members department and request re-activation.

4.1.6 - Upon initial registration, members will be asked to choose a division that they wish to join. A member may request a division transfer at any time, however all transfers are subject of approval by the members prospective division and the Membership Department.

4.1.7 - Upon registration, you must provide a valid, working e-mail address to be used for communications about the IVAO™ network. It is the member's responsibility to make sure that the address on file is valid at all times.

4.1.8 - The minimum age for IVAO members is 13 years. Members have to confirm -upon registration- that they are 13 years or older when joining IVAO™.

2. Approved software

4.2.1 - Only approved software is permitted for connecting to the network and for voice communications.

4.2.2 - Approved software can be downloaded from http://www.ivao.aero/network/so/

4.2.3 - Online traffic can be monitored using approved software.

4.2.4 - For voice communications between pilots and ATCs, approved software is used.

3. Connecting

4.3.1 - When connecting to the network as pilot, ATC, or observer, members must use their real first and last name which must be the same as name used in the registration process. Nicknames or fake names are not allowed. Staff members may connect using their approved staff callsign, when performing their staff function.

4.3.2 - Members are required to use their registered account when connecting to the network regardless of location. Sharing of accounts or password is prohibited.

4.3.3 Members must not have more than ONE connection to the network at any given time. Exceptions are stated in the next point.

4.3.4 - Staff members are allowed to have temporarily two simultaneous connections to the network provided it is to perform a valid staff task. The reasons for the multiple connections must be clearly stated in the flight plan remarks section or ATIS. Valid staff tasks include software development or training/exam sessions. Supervisors may also have a double connection in order to temporarily perform a supervisor function provided no other supervisors are available to assist. Organizational account holders shall be permitted multiple connections as outlined in 4.7.

4. On-line

4.4.1a - Divisions located in a country without an approved ICAO language must use English.

4.4.1b - Divisions with an approved ICAO language must use English as the primary language. The official ICAO language may also be used as a secondary language provided both the ATC and pilot speak the language, however, the ATC must still be able to control in English.

4.4.1c - ICAO languages are English, Spanish, French, Arabic, Russian, and Chinese.

4.4.2 - Communication between Pilots and ATC may be in text, voice or both.

4.4.3a - Abusive and/or offensive communications, whether public or private and regardless of transmission means, which create an intimidating, hostile, or offensive environment will not be tolerated.

4.4.3b - IVAO believes that the protection of our children is a first priority. Users who are found to have engaged in any of the following conduct with minors, defined as users under the age of 18, may face sanctions up to an including a referral for criminal prosecution:
- Unwanted sexually explicit communications/interactions, including, but not limited to, sexual propositions, "grooming" behaviour, innuendos, etc.
- Dissemination/transmission of harmful information, including, but not limited to, pornographic images, pornographic websites, etc.
- Furthermore, reasonable attempts for parental notification of minor victims shall be made. Parental notification for minor suspects may be considered.

4.4.4 - Usage of the network, e.g. text messages, is limited to information and material concerning IVAO. Usage of the network to communicate information and material other than IVAO™ information, e.g. VA publicity, is prohibited and is subject to a suspension of membership privileges.

4.4.5 - On the IVAO™ network Hi-jacking, war simulation and all other forms of aggression are not allowed.

4.4.6 - Members are expected to behave in a friendly and respectful manner. Please be patient with new pilots and controllers.

4.4.7 - You are expected to be at your computer while online as a pilot or controller. Short breaks lasting no longer than 20 minutes are permitted. ATC shall provide service at all times. Under exceptional circumstances, an absence of maximum 5 minutes can be allowed if traffic permits.

4.4.8 - Users not responding to communications with ATC or to Supervisor's calls 20 minutes after the first attempt of communication will be disconnected from the network. This period of time could be reduced depending on the particular circumstances of the situation. In addition, a suspension of membership privileges could be issued and/or the flight/ATC hours of the day up until the suspension moment can be deleted.

4.4.10 - Within your ability, try to maintain an "as real as possible" attitude. New members are encouraged to add "newbie" to the remarks section of their flight plan or in the ATIS section as appropriate.

4.4.11 - Within your capabilities, try to execute the simulation "as real as possible".

4.4.12 - Users must follow the instructions of supervisors and administrators to ensure everyone can enjoy the simulation.

5. Suspensions

4.5.1 - During the period of an account suspension, the user will be unable to connect to the network.

4.5.2 - Suspensions are issued by Supervisors or Administrators, but are subject to review by Executive.

4.5.3 - Click here if you want to check the suspensions' table. Suspension durations for infractions which are not predetermined from the Suspension Table are reviewed by Executive.

4.5.4 - In addition, Executive can issue a ban from the forum should circumstances warrant.

4.5.5 - Only the IVAO forums are official forums

6. Ratings for Controllers and Pilots

4.6.1 - Ratings for pilots and controller shall be classified as "Basic Ratings", "Advanced Ratings", and "High-Level Ratings", by the Training Department.

4.6.2 - Practical examination requirements for controllers and pilots to achieve "Advanced Ratings" shall be described as "Unit Requirements" and "Pilot Requirements" within the Training Department website.

4.6.2.1 - For training and exams the member must be member of an active Division. ATC or pilot training and exams are not possible in non-active divisions.

4.6.3 - Ratings for Senior ATC Instructor (SAI) and Senior Flight Instructor (SFI) require the member to fulfill additional instructional responsibilities as defined by the Training Department. The Training Department reserves the right to downgrade a member if the additional requirements are not met. The ratings of Chief ATC Instructor (CAI) and Chief Pilot Instructor (CPI) are ratings reserved for past and present Training Directors and/or Training Assistant Directors. These ratings are designated by the Executive and as such, members can not apply for these ratings.

4.6.4 - Organization accounts shall have ratings fixed at the FS3 pilot level and OBS ATC level. The ATC level may be increased by the Training Director upon a show of cause. These accounts shall be ineligible for exams.

7. Organizational Accounts

4.7.1 - Organizational Accounts shall be granted to organizations who apply and meet the criteria for such account.

4.7.1.1 - Application for an Organizational Account shall be done via e-mail to the Membership Department. The application shall contain, at minimum, the legal and trade name of the organization, physical location (ordinary place of business), the nature of the organization including services provided, legal/taxation status (e.g. non-profit, corporation, etc), and how they wish to utilize IVAO services.

4.7.1.2 - Organizations shall provide contact information for at least two individuals considered to be managers. This information shall be made available to supervisory staff.

4.7.1.3 - Organizations agree that they shall not profit from the use of the IVAO services. (e.g. An organization which charges a fee to its clients for instruction time or use of equipment may do so, however, is prohibited from charging an additional fee for the use of any IVAO service.)

4.7.1.4 - The name listed on the account shall be the registered name of the company or organization.

4.7.1.5 - Organizations agree to promote IVAO through the use of a visible IVAO logo and URL on their website. IVAO agrees to promote the organization through the affiliate program.

4.7.1.6 - Virtual Airlines are not eligible for an Organizational Account.

4.7.2 - Managers of the organization shall be held responsible for client conduct while utilizing IVAO services.

4.7.3 - Organizational Accounts shall be listed as members of the division in which their primary place of business is located.

4.7.3.1 - Organizational Accounts may apply for Guest Controller Approval (GCA) to any division subject to the requirements in place.

4.7.4 - Organizational Accounts are not considered to be an individual and, therefore, are ineligible as staff, ineligible for any awards, and cannot be associated with a virtual airline.

4.7.5 - Organizational Accounts may have multiple connections to the network not to exceed the number of authorized connections per the individual agreement. This number shall be available in the staff comments of the account profile.

8. Rules and Regulations for the use of voice communications

7.1 - The use of voice communications is recommended due to the heightened sense of realism, however, there are numerous reasons why members do not use voice communications. As such, voice and text are both equally acceptable forms of communications and ATC services cannot be refused to a pilot using text communications. At the discretion of the controller, communications by text may be more efficient depending upon work load, language skills, or typing ability.

7.2 - Only approved voice software is permitted for voice communications.

7.3 - Password protected channels are not allowed.

7.4 - The use of IVAO™ voice servers is only allowed when you are also connected to IVAN with approved software. IVAO™ voice servers may be used for IVAO™ meetings without being connected to IVAN.

7.5 - As an exception, channels may be opened by registered virtual airlines as "company channels," by special operations groups for coordination purposes, and by staff members for staff meetings. Member virtual airlines are allowed to create a "registered" company channel on the nearest teamspeak server to the airline's division of registry. The channel shall be created in the format ICAO_CC where ICAO stands for the three letter ICAO code of the airline. As an example, Netherline VA = NHL_CC, Topic = http://www.netherline.nl, Description = (VA may include a short description here).

7.6 - ATC Services shall use their ICAO identifier of their airspace and position for their call sign as the voice channel and own connection, e.g. EBBR_APP or KDFW_TWR. The use of a frequency, e.g. 112.80 or 113.10, as a TeamSpeak voice channel for ATC Services, is prohibited.

7.7 - Users may create teamspeak channels on the cc.ts.ivao.aero server. However, users shall not create channels which are "registered", change the "max users" option, or "password" protect them. These options are reserved for supervisors, administrators, staff members, or as noted in the following rules.

7.8 - Deleting Staff Channels is prohibited.

7.9 - Pilots shall use the same call sign as they are connected with their Pilot Client.

7.10 - Playing of music and/or other broadcasting of sound not related to the simulation, is not allowed and will result in a suspension of 48 hours.

7.11 - Voice server administrators, at their discretion, may "ban" a member who has violated a rule in this section. The length of the "ban" shall be determined by Executive.

7.12 - For training purposes "debriefing " channels are not allowed to be password protected. However the "Max Users" can be restricted.

7.13 - When taking an ATC position your are allowed to create a "Registered" channel (Keep in mind that when another member taking over your ATC position to grant him your Channel Admin rights).

7.14 - Above all, be nice, speak clearly, and have patience with new members.

7.15 - Recording in Teamspeak will not be allowed under any circumstance except with the prior authorisation of the Executive in general and the Public Relations Director in particular for Public Relations related matters.

PILOT RULES AND REGULATIONS

1. Before Connecting

6.1.1 - As a minimum, pilots must be able to take off and land at an airport.

6.1.2 - Pilots must be able to comply with basic air traffic control instructions such as being instructed to turn onto a particular heading or being given a level to climb or descend to.

6.1.3 - Pilot users must connect only with the approved software and have a basic understanding of how to use it.

6.1.4 - Pilot users shall not connect to the network while positioned on a runway or taxiway as this may cause conflicts with other aircraft.

6.1.5 - Pilot callsigns should be either three letters (ICAO) with numbers/letters to represent Commercial Carriers, e.g. NWA1014 "Northwest Airlines Flight 1014" or represent a typical country registration, e.g. Germany DAAYA, where the "-" is not used. In the case of a military flight, callsigns are country specific and the country military callsigns should be consulted. For more information on typical callsigns by country, please go to this link: http://en.wikipedia.org/wiki/Aircraft_registration.

2. Connecting

6.2.1 - For the enjoyment of all members, it is strongly recommended that you connect as a pilot user only if you intend to complete your entire flight. Exceptions are given to "long haul" flights where a pilot user may choose to only complete a portion of a flight and return later to complete the remaining portion. In this case, pilot users are encouraged to disconnect and reconnect while over the ocean where the possibility of a conflict is minimal. This rule does not apply to any tour which has its own rules.

6.2.1a - If disconnecting during a flight to connect at a later time (as described in 6.2.1) , the user should check to see if any ATC is online in the vicinity. If ATC is online, the user should inform the controller the position they wish to connect in before doing so.

3. On-line

6.3.1 - Pilot users must have transponder activated whilst in the air.

6.3.2 - Prior to each flight, all pilot users are required to file a flight plan through the approved pilot software.

6.3.3 - If you are a new or inexperienced user, it is recommended that you place a remark indicating this in your flight plan so air traffic controllers know to provide you with extra assistance if required.

6.3.4 - In areas without air traffic control, pilot users must monitor "UNICOM" 122.800 on their communications radio.

6.3.5 - In areas without air traffic control, pilot users should check for air traffic control on a regular basis and contact the appropriate air traffic control station when requested to do so.

6.3.6 - Never use the Emergency (also known as GUARD) frequency of 121.500 for anything other than an emergency situation.

6.3.7 - Pilots should always read back and follow ATC instructions unless doing so could endanger the operation of the aircraft.

6.3.8 - Simulation of a radio failure (i.e. squawking 7600) is not cause to ignore ATC instructions in case of a conflict or requests from supervisors.

4. Special Operations

6.4.1 - Coast Guard operations, search and rescue missions, and military aircraft are examples of "Special Operations". As Special Operations are a part of real-world aviation, they are also a part of the simulation, however, certain aspects of special operations are prohibited on the network including simulation of terrorism and acts of war. Although armed conflicts do exist in the real-world, we do not allow the simulation of any form of aggression or violence on the network. For further information regaring our policy, please see the rules and regulations for the special operations.

CO-ORDINATED UNIVERSAL TIME

1. Introduction

In the aviation world, the reference time is the co-ordinated Universal Time or UTC called “Zulu” time.

This time is set using several time references in some science laboratories.
This time origin is Greenwich Mean Time (GMT) which is set in the Greenwich meridian 0°.
This time is set as a reference for all countries in the world.

2. Why do we use UTC or “Zulu” Time?

2.1. Local time

Depending on its position in the world, a country can adopt its own hour (can be several hours depending on its country zone) in order to have noon time in the middle of the day.

In conclusion, local country times will differ around the world.

Be aware that some countries adopt local hour shifts between spring and winter period in order to save power consumption.

2.2. Problems when using local time

For a flight which takes off at 13H00 local time at Göteborg-Landvetter airport ESGG (Sweden) and lands at 8H00 at Hong-Kong VHHH (China), if you do not know the local time calculation, it is difficult to know the exact number of hours this flight takes.

The result is certainly not 19 hours (19H = (08H – 13 H) + 24)
If you know that the flight takes off at 12H00 UTC on ESGG and lands at 24H00 UTC on VHHH, with the same reference, we are now sure that the flight takes 12Hours (12H = 24H – 12H)

That is why all aircraft flight plans adopt UTC time in order to have the same reference all around the world and do not take into account the local hours offset during their flight and also for calculation purposes.

UTC time is mandatory for all flights in order to have the same worldwide reference.

2.3. Difference between Local time and UTC time

The difference between UTC time and the local time is set by national regulation and the difference is given with a multiple of hours and sometimes one half hour is added.

The table below shows an example of offsets used to calculate the local time in some countries:

City (country)	Local Time
London (UK)	UTC + 0
Paris (France)	UTC +1
Ankara(Turkey)	UTC +2
Manama(Bahrain)	UTC + 3
Teheran(Iran)	UTC +3:30
Moscow(Russia)	UTC + 4
Karachi(Pakistan)	UTC + 5
Delhi(India)	UTC + 5:30
Yekaterinburg(Russia)	UTC +6
Phnom Penh(Cambodia)	UTC +7
Canton(China)	UTC + 8
Tokyo(Japan)	UTC + 9
Canberra(Australia)	UTC + 10
Nouméa(New Caledonia)	UTC + 11
Wellington(New Zealand)	UTC + 12
Nuku'olofa(Tonga)	UTC +13
Pago Pago(Samoa)	UTC -11
Tahiti(French Polynesia)	UTC -10
Anchorage(USA)	UTC -9
San Francisco(USA)	UTC - 8
El Paso(USA)	UTC -7
Chicago(USA)	UTC - 6
New York(USA)	UTC - 5
Caracas(Venezuela)	UTC -4:30
Halifax(Canada)	UTC -4
Rio de Janeiro(Brazil)	UTC -3
Fernando de Noronha(Brazil)	UTC -2
Acores(Portugal)	UTC -1

3. Night definition in aeronautical terms

It has been decided that:

- Daytime ends when the sun is less than 6° below the horizon.
- Nigh time ends when the sun is 6° below the horizon

With this definition, it has been agreed that night:

- Starts 30min after the sunset at the latitudes between 30° and 60°
- Starts 15min after the sunset at the latitude between 0 and 30°
- Ends 30min before the sunrise at the latitude between 30° and 60°
- Ends 15min before the sunrise at the latitude between 0 and 30°

FREQUENCY

1. Introduction

An air traffic controller shall communicate with pilots in command of all aircraft in his airspace.
In real aviation, all aircraft and all air traffic controllers are equipped with radio transmitters and antennas.

Each radio transmitter uses one unique frequency at a time and performs half duplex communication (this frequency is sometimes also called a radio channel). The radio transmitter can be tuned to the selected frequency manually by its user. In half-duplex communication, each party can communicate to the other, but not simultaneously; the communication is one direction at a time.

1.1. In the real world

In the real world, the pilot uses **radio communication in the VHF band** (very high frequency).
Voice communication starts from 118.00 MHz to 136.000 MHz in the VHF band.

Oceanic flights can use the HF band (high frequency) using the long range communication property of this frequency. Military aircraft can use the UHF band (ultra high frequency). These bands are not simulated in IVAO.

1.2. In IVAO network

In the IVAO network, users must not use any real radio transceiver.

The use of aeronautic radio transmitters is reserved for real world flights.
It is forbidden to use them for any IVAO activities.

In IVAO, the radio communications are simulated using communication software:

- **TeamSpeak 2** software for communication using voice
- **IvAp interface** for communication using text and to obtain ATIS information, METAR, TAF …

In order to make the communications more realistic, you can choose the VHF frequency in your cockpit or IvAp interface and the software will do the rest to connect you to the correct channel.

The **IvAp** interface is an IVAO tool which synchronizes the pilot frequency in the cockpit and the interface with the air traffic controller TeamSpeak channel (if existing).
An air traffic controller in IVAO is responsible to tune the frequency of his position in the **IvAc** radar software, to create a channel in the selected TeamSpeak server, and to complete his ATIS accordingly in order to perform voice control sessions.

2. Use of frequency in IVAO

2.1. For the IVAO air traffic controller

Before you can control an active position, you must manually set the VHF frequency of your controller position in your IvAc radar scope. This frequency tuning is not automatic.

This frequency can be taken from:

- The IVAO database (HQ database or your division database)
- Real charts if the database was not updated

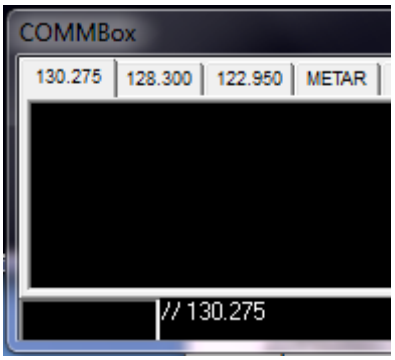
We advise you not to take any real frequency you may have heard on a real radio receiver. These frequencies are subject to changes in the functionality of many parameters that IVAO does not use nor simulate.

2.1.1. How to tune the frequency in IvAc?

Follow the procedure below:

- Click on COM1 tab in the IvAc COMMbox window
- Type double bars ***//*** followed by the VHF frequency wanted

Example: //130.275



2.1.2. How to tune TeamSpeak for voice communication?

Tuning TeamSpeak does not require any VHF frequency. You create a channel by only using your position name. If you use a frequency value as a channel, the system will not work.

What happens when you open an active position as an air traffic controller?

1. When connecting to the IVAO network (which is called IVAN) with IVAC, you must choose a network server and a TeamSpeak server.
2. Your position is identified by using the **ICAO code of your control zone or airfield** - for example: **ICAO_POS**
3. The VHF frequency is tuned on IvAc and sent via IvAc to the IVAN network to associate your position with the frequency.
4. On TeamSpeak you are connected as - for example: **ICAO_POS**
5. Now create your unique channel on TeamSpeak using your position - for example: **ICAO_POS** (since two different positions can share the same frequency, you cannot use the frequency in the channel name).
6. The link between the position and the frequency is created by the ATIS of the position and it is broadcasted in the IVAN network.
7. When a pilot wants to connect to an air traffic controller, and after tuning to the correct frequency, he receives the ATIS information automatically in the IvAp interface and IvAp then tunes TeamSpeak to the correct IVAO ATC channel using the position **ICAO_POS**.

2.2. For IVAO pilots

If you want fly on IVAO and you are on the apron of an airfield, you must connect to the IVAO network named IVAN.

The first step is to tune IvAp to UNICOM 122.800MHz as the active frequency.

IvAp version

x-IvAp version

This frequency is the unique worldwide self-announcement air to air frequency for all airfields in IVAO.

This frequency can only be used utilising text for technical and practical reasons.

When you are ready to begin your flight, check in the IvAp interface if there are any air traffic controllers available in your zone.

IvAp version

x-IvAp version

Any air traffic controller requires 2 way radio communication contact prior to any movement:

1. If an Air Traffic Controller is available, set the VHF frequency on IvAp as the active frequency. You will **receive the ATIS information by text** and **TeamSpeak will automatically connect to his channel** (except if you have deactivated voice mode or the air traffic controller is in text only mode).
2. If there are no air traffic controllers in your area, you must remain on the Unicom frequency 122.800MHz and perform self-announcement text messages using the scratchpad in IvAp interface.

Be aware that when there is any technical problem with TeamSpeak software that does not permit two way voice communication, you shall communicate using the IvAp scratchpad using text as secondary mode. You are not permitted to ignore the text mode procedure in that case.

2.3. 8.33 kHz

The new 8.33 kHz channel width for radio communication frequency is already integrated via IvAp, IvAc and IVAN network.

In your cockpit, you must setup only the first 2 digits after the decimal and the 3rd digit is automatically tuned by the system to either a 0 or 5.

The 8.33 kHz spacing channel is mandatory in some countries in upper airspace.
As the IvAp interface is compatible with 8.33kHz, please add the letter Y in the equipment in your flight plan.

EMERGENCY FREQUENCY AND MESSAGES

1. Definition

The international emergency frequency is 121.500MHz in the VHF band.
It shall be used for emergency purposes only.

The emergency frequency is called GUARD in IVAO ATC client. GUARD is an old denomination that should not be used any more (Rules of the air).

2. Emergency frequency: air traffic controller use

An air traffic controller shall not use the emergency frequency for air traffic clearance and communication with a pilot. This frequency is considered to be a pilot's emergency frequency.

If there is an ATC critical situation, **where safety is endangered** (virtually of course, but if you want it as real as it gets...) controllers may use the emergency frequency.

3. Emergency frequency: pilot use

3.1. Pilot already in contact with an air traffic controller

Facing an emergency situation, the pilot shall communicate the distress message "mayday" and remain on the ATC frequency.

There is no reason for the pilot to communicate on or to switch to the emergency frequency.

3.2. Pilot in emergency entering a controlled area

After declaring an emergency or distress call with a squawk of **7700**, a pilot can use the emergency frequency 121.500MHz in order to communicate his intention **only** if he cannot join any active air traffic controllers in this airspace after several attempts.

Under distress, a pilot can possibly panic and may not know how to change the frequency.

3.3. Pilot outside any controlled areas

After declaring an emergency or distress call with a squawk of 7700, a pilot shall declare a state of emergency and continue to communicate on UNICOM 122.800MHz.

The pilot can only use the GUARD frequency 121.500MHz if he realizes that other pilots don't react to his emergency message on UNICOM.

4. State of Emergency

There are two states of emergency: Distress or Urgency.

There are many factors and different circumstances that determine whether an urgency or emergency exists or not. An engine failure with a four-engine aircraft is very different from an engine failure of a single-engine aircraft.

In general, the pilot in command decides about the situation he faces. The situation can be:

- A minor failure or an urgency
- An emergency or a distress

4.1. Distress

A distress is a condition of being threatened by serious and/or imminent danger and of requiring immediate assistance.

Examples: ditching, crash landing imminent, total engine failure...

If a pilot finds himself in such a situation, obviously he will have to:

- transmit a distress message:

  "Mayday, Mayday, Mayday", (3 times mayday)
  "This is [aircraft call sign]"
- transmit as many of the following elements as necessary and as time permits :
  - aircraft position and heading
  - flight level, altitude or height
  - aircraft type and POB (number of persons on board)
  - nature of emergency
  - intentions and abilities or limitations
  - any other relevant piece of information (weather, endurance, intentions...)

If the pilot is unable to send any radio message at that time, he can and should try to set his transponder to squawk 7700.

In IVAO, it is recommended to squawk 7700 in any case of declared emergency. When an aircraft is no longer in a state of distress, a cancellation message shall be transmitted on the frequencies used for the (original) distress message.

4.2. Urgency

Urgency is a condition concerning the safety of an aircraft or some persons on board but which does not require immediate assistance.

Examples: lost, fuel shortage, partial engine failure, navigation system failure...

If a pilot finds himself in such a situation, obviously he will have to:

- transmit an urgency message:

  "Pan Pan, Pan Pan, Pan Pan", (3 times pan pan)
  "this is [aircraft call sign]

- transmit as many of the following elements as necessary and as time permits:
  - aircraft position and heading
  - flight level, altitude or height
  - aircraft type and POB (number of persons on board)
  - nature of urgency
  - intentions and abilities or limitations
  - any other relevant piece of information (weather, endurance, intentions...)

Normally in this case the transponder squawk remains as before, since this is not an emergency.

When an aircraft is no longer in a state of urgency, a cancellation message shall be transmitted on the frequencies used for the (original) urgency message.

5. Emergency procedures

In principle, the captain decides what the situation is. If the captain decides that there is an emergency situation, he will declare an emergency.

If the captain thinks that a state of "urgency" is good enough at that time, he will say so.
In other words, one situation may be different from the other, but also do remember that one situation may not be the same as the next. Each has to be evaluated on its own merits.

The main focus of the pilot is to safeguard his aircraft, its passengers and cargo. Quite often this may mean a priority or precautionary landing. The pilot may ask for priority, but is not obliged to do so.
In other words, the captain is and remains responsible and he will act accordingly.

In addition he should try to inform ATC as much as possible about his state and above all, his intentions. But he is not obliged to if he cannot inform ATC. The most important task is to fly the aircraft, keeping it safe is the most important thing.

USE OF UNICOM

1. Definition

UNICOM (Universal Communications) is a text feature that allows two way text communications between pilots. The aim is to report their positions and intentions should there be no active and relevant ATC available.

UNICOM is a tool for air to air self-information to be used by IVAO pilots when there is no controller active in their vicinity.
The use of UNICOM allows all pilots to be informed of the presence of nearby aircraft movement and to know the intentions of each of them, whether on the ground or in flight.

In IVAO, UNICOM has one dedicated frequency for use in text mode: 122.800MHz

2. Interest and explanation of Unicom

In the real world, Air Traffic Services are very often present. We have:

- En-route air traffic controllers that control the FIR and UIR airspace 24h per day and are available every day of the year.
- Major airports are mostly permanently staffed with at least one Air Traffic Control position. Usually available 24h per day or otherwise between 6h to 24h or when there is traffic. Traffic is not permitted outside of the operating hours. However, it is possible to specifically request a controller at an airport and to file a flight plan to that specific airport.
- Smaller airports are open with an active air traffic control service during slots of commercial traffic (7h-12h 14h-21h) and on days when commercial traffic is present. Outside of these time slots, the service is limited to self-flight information for pilots on a published radio frequency.
- Very small VFR airfields sometimes have only flight information services that are open only during day time or on weekends. Outside of these time periods, pilots rely on air-to-air self-information procedures.

On IVAO, active control is often not present. This is one of the main differences between the real and virtual world.

As in the real world, on the IVAO network and in the absence of air traffic control, all pilots must ensure self-information in flight and on the ground.
This is a mandatory procedure (it is not optional).

All pilots do not know all the frequencies at each airfield in the world, and in IVAO, the solution was to choose a **unique self-communicating information** service through the universal communication feature commonly known as UNICOM on a defined frequency 122.800MHz and accordingly set via IvAp.

3. Characteristics of UNICOM

What you should know about Unicom:

- **IvAp** is equipped with a filter that removes communication channels which are too far from your flying area.
- Only aircraft located in your area will receive your text transmissions in IvAp
- Only aircraft transmissions in your area will be displayed on your IvAp

The UNICOM frequency is 122.800MHz and is used throughout the IVAO world.

UNICOM is used by pilots in command of an aircraft to:

- send information to other pilots to notify them of his intentions of flying or moving on the ground
- to receive any information from other pilots and to be informed of their intentions and their movements
- coordinate with other pilots for a landing or take-off procedure, for altitude separation, for negotiating on integration in the traffic pattern, or for a visual separation

In summary, the use of UNICOM allows all pilots to be informed of the presence of nearby aircraft movement and to know the intentions of each of them, whether on the ground or in flight.

This is called Situational Awareness: know where you are, who is around you and what is happening.

To do this, you must submit your intentions on UNICOM in advance so that everyone can correctly anticipate the actions of others.

4. Text only and NO VOICE

All UNICOM transmission must use only text mode (via IvAp) and the transmission shall be made in aviation English. No voice can be used.

The English to be used is the basic words from standard phraseology.
The use of codes and text shortcuts are permitted.

There are six ICAO languages used in aviation (English, French, Spanish, Arabic, Chinese, and Russian). Sometimes the local country ICAO language is used instead of English. Please pay attention that the use of another language other than English does not allow self-information as effectively with foreign pilots!

Why UNICOM voice cannot be used:

- Having several hundreds of pilots voices on the same frequency would not be feasible
- The voice servers cannot filter channels according to distance
- There are not enough voice servers to accommodate everyone on UNICOM (saturation)
- Those who do not speak English would be penalized.

SELF-ANNOUNCING PROCEDURES

1. Introduction

If no ATC is available at the airfield or area you are planned to fly to, then you are on your own.

In the IVAO network, we have UNICOM.
It is a text mode procedure allowing pilots to transmit relevant information on their flight status to nearby pilots.

The TeamSpeak "channel" is NOT to be used for this or any other purpose!

Providing flight status information will help everyone in the vicinity to be aware of any other traffic around - be it on the ground or in the air.

This is part of what is called Situational Awareness: Be aware of where you are and what is around you.

It is a RULE in IVAO to use UNICOM to transmit your intentions timely for the benefit of the other users in your vicinity - therefore use it as such!

UNICOM can be set by the pilot by setting his radio frequency to 122.800 MHZ.

2. Self-announcing procedure

2.1. Five W rule

To help you understand and use this self-announcing procedure, there is the rule of the Five W's.

The Five W's are:

- **What?** Traffic advisory is a text message from a pilot to other pilots on **what you plan to do**.
- **Who?** All pilots flying or intend to fly when no ATC is available.
- **Where?** On the IVAO network when no ATC is available.
- **When?** Anytime your aircraft moves on the ground or in the air.
- **Why?** To avoid conflict with other aircraft - this is an example of airmanship (being nice to others).

2.2. Check list

Ensure you observe and follow the points below first:

1. Make sure no ATC is serving your area or airfield. Check this periodically. If no ATC is available, make sure you are on UNICOM or your active COM frequency is set to 122.800MHz
2. Pilots are either on an assigned ATC frequency or on UNICOM 122.8
3. Monitor UNICOM 122.800MHz. This means watch and read any text message that may affect your operation. Text messages can be read on the pilot client (IvAp).
4. Look outside before you move your aircraft. Weather permitting, if there is nice weather with good visibility (VFR conditions) – then have a good look outside the cockpit to watch for other traffic.
5. Make sure your transponder and TCAS are switched on. This is required to be seen on other pilot's TCAS when within range. If you do not switch your transponder to the Charlie/Sierra/TX/ON position, other TCAS will not spot you!
6. Continue announcing traffic advisory in text on UNICOM periodically. Because you never know if another aircraft has just logged on at your airport or is close in your area.
7. Know where you are at all times. Otherwise your traffic advisory may be incorrect and may cause a conflict.
8. Know the current time - in UTC (universal coordinated time) or Zulu. Avoid saying or using "local time"
9. Text traffic advisory messages should be standard in English anywhere on the IVAO network. Be familiar with the main Aviation English commands and also use the standard Abbreviations.
10. Always keep your traffic advisory simple so that everyone will understand.

While announcing text traffic advisories, you do not need to repeat your call sign.
All text messages using IvAp include your call sign automatically.

2.3. What information should be in the traffic advisory?

The first goal of the traffic advisory to other aircraft is:

- What are my intentions?

Of course you can use the other information:

- Where am I?
- What type of aircraft am I using?

2.4. When should the traffic advisory be used?

During the following phases where you are moving:

- push back
- taxi
- take-off
- climb
- cruise and level flight
- descend
- approach
- landing
- taxi

2.5. Examples with using abbreviation

To avoid large text-based communications, this chapter gives you the abbreviations commonly used in text mode in English:

KJFK s/u and p/b gate E4
At KJFK starting up and pushing back at gate E4

EDDL taxi h/p N1 rwy 23L
At EDDL Taxiing to holding point n1 runway 23 left

LFPO l/u and w rwy 06
At LFPO lining up and wait, runway 06

EBBR t/o rwy 25R
At EBBR taking off runway 25R

LFPG SID LATRA1B c/m FL200
LFPG departure SID LATRA1B, climbing to flight level 200

Dct BEBIX FL310
Direct BEBIX at flight level 310

LFBD STAR LMG4 d/m FL160
LFBD arrival LMG4 descending TO maintain Flight Level 160

Maintain FL80 for separation with AF431
Maintaining flight level 80 for separation with AF431

t/l hdg 320 behind AZA456
Turning left heading 320° behind AZA456

LFRS ILS app rwy 03
At LFRS Intercepting ILS approach runway 03

LERS 4Nm final rwy 03
At LERS 4nm final runway 03

DAAG clrd to land rwy 31
At DAAG cleared to land runway 31

LFPG rwy 26L vac, cross rwy 26R
At LFPG runway 26 left vacated, crossing runway 26 right

LFPG Taxi gate B20 via D
At LFPG taxiing to gate b20 via taxiway d

3. List of abbreviations

Txt	English translation
'	= feet
a/c	= aircraft
a/d	= aerodrome
acft	= aircraft
aff	= affirm, yes
afld	= airfield
alt	= altitude
alt.set	= altimeter setting
apch	= approach
app	= approach
APP	= Approach controller
apt	= airport
arpt	= airport
arr	= arrival
base	= base leg
c/m	= climb and maintain
caf	= cleared as filed (as your flightplan)
cc	= correct
circ	= circling approach
clr	= clearance, cleared
crld	= cleared
crs	= course
CTR	= Center or Radar Controller
d/m	= descend and maintain
dct	= direct
DEL	= Delivery controller
DEP	= Departure controller
dep	= departure
des	= descend
dis	= disregard, ignore
disrgd	= disregard, ignore
dnwd	= downwind
est	= established
exp	= expect
FL	= flight level
fp	= flightplan

fq	= frequency
freq	= frequency
frq	= frequency
FSS	= Flight Service Station controller
ft	= feet
g/d	= gear down
g/p	= glide path
gbye	= good bye
gday	= good day
GND	= Ground controller
gnight	= good night
gnite	= good night
GP	= glide path
gs	= glide slope
h/a	= hold at
h/o	= hand-off
h/p	= hold position, holding pattern, holding point
h/s	= hold short
hdg	= heading
IAF	= Initial Approach Fix
ILS	= Instrument Landing System
IM	= Inner Marker
inbd	= inbound
KIAS	= IAS in knots
kt	= knots
l/h	= left hand
l/u and w	= line-up and wait
land	= land
LLZ	= Localizer
luw	= line-up and wait
min	= minima
MM	= Middle Marker
neg	= negative, no
NM	= Nautical Miles
OM	= Outer Marker
outbd	= outbound
pax	= passengers
pkg	= apron, park
plz	= please
POB	= People On Board (number of)
pos	= position
r/h	= right hand

r/m	= reaching minima
r/p	= report passing
r/v	= radar vectors
rdl	= radial (of VOR)
rdr	= radar
rep	= report
req	= request
rgr	= roger, received
rpt	= report
rwy	= runway
s/u	= start up
sby	= stand by
SID	= Standard Instrument Departure
SM	= Statute Miles
sq	= squawk
STAR	= Standard Arrival Procedures
stby	= stand by
std	= standard
stdy	= steady
t/f	= turning final
t/l	= turn left
t/o	= take off
t/p and hold	= taxi into position and hold
t/r	= turn right
tl	= turn left
tleft	= turn left
tnx	= thank you or thanks
tr	= turn right
tright	= turn right
trk	= track (of NDB)
TWR	= Tower controller
vect	= vectors
wilco	= will comply, will do what is requested
wx	= weather

These abbreviations could be used as well in a text-text communication with ATS, if voice communication is not possible.

AUTOMATIC TERMINAL INFORMATION SERVICE - ATIS

1. Introduction

Automatic Terminal Information Service, or ATIS, is a continuous broadcast of recorded aeronautical information in busier airports.

ATIS broadcasts contain essential information, such as weather information, active runways, available approaches, NOTAM, and any other information required by the pilots.

Pilots listen to ATIS broadcast information before contacting the local air traffic controller, in order to reduce the controllers' workload and to prepare their flight.

2. ATIS in real life

The ATIS at an airport is usually given by an automated or recorded voice on a specific VHF frequency or via the vocal channel of a radio-navigation beacon.

Whenever ATIS is provided, the preparation and dissemination of the ATIS message shall be the responsibility of the tower controller or the aerodrome flight information controller (AFIS).

The ATIS recording is updated at fixed intervals or when there is a significant change in the information.

This change is followed by advancing the alphabetic letter designation. The letter progresses down the alphabet with every update and starts at Alpha after a break in service of 12 hours or more.

Pilots shall indicate that he has "information" and the ATIS identification letter to let the controller know that the pilot is up to date with all current information.

Most airports in a certain country will often have the same ATIS format or layout with the same automated voice. In very complex airports, it is possible to have two ATIS frequencies, one for arrivals and one for departures.

ATIS transmissions can be received in a large zone (60NM maximum and 25000ft maximum) and ATIS is unique to each airfield.

2.1. ATIS messages

ATIS messages containing both arrival and departure information shall contain the following elements of information in the order listed:

- name of aerodrome
- arrival and/or departure indicator
- contract type, if communication is via D-ATIS
- designator
- time of observation, if appropriate
- type of approach to be expected
- the runways in use
- significant runway surface conditions and, if appropriate, braking action
- holding delay, if appropriate
- transition level, if applicable
- surface wind direction and speed, including significant variations
- visibility and, when applicable RVR
- present weather
- cloud below 1 500 m (5 000 ft) or below the highest minimum sector altitude, whichever is greater;
- air temperature
- dew point temperature
- altimeter setting(s)
- any available information on significant meteorological phenomena
- wind shear
- information on recent weather of operational significance
- trend forecast
- specific ATIS instructions
- other essential operational information

2.2. Example of a real ATIS

This is an example of a real ATIS from Dulles airport.

DULLES INTERNATIONAL INFORMATION SIERRA.
1300 ZULU
WEATHER MEASURED CEILING THREE THOUSAND OVERCAST.
VISIBILITY THREE, SMOKE.
TEMPERATURE SIX EIGHT. DEWPOINT FOUR THREE.
WIND THREE FIVE ZERO AT EIGHT.
ALTIMETER TWO NINER NINER TWO.
ILS RUNWAY ONE RIGHT APPROACH IN USE.
LANDING RUNWAY ONE RIGHT AND LEFT, DEPARTURE RUNWAY THREE ZERO.
ARMEL VOR OUT OF SERVICE.
ADVISE YOU HAVE INFORMATION SIERRA.

3. ATIS in IVAO

With the current network limitation, the IVAO network has adapted the ATIS information available for pilots:

- Each air traffic controller has his own ATIS
- ATIS is written in text mode by air traffic controllers in a predefined form
- Pilots can only read ATIS information in text mode when tuning the ATC frequency or sending the appropriate command to the server with a specific command
- ATIS contain the TeamSpeak server in the first line

Like in real life, pilots shall indicate that he has "information" and the ATIS identification letter to let the controller know that the pilot is up to date with all current information.

3.1. ATIS of an area control centre

In real life, an Area Control Centre controller does not establish ATIS.
In IVAO, the Area Control Centre controller has a small ATIS in order to ensure the system works.

Area Control Centre ATIS in IVAO has:

- Address of TeamSpeak server and channel name in the server
- Literal name of ATC position
- (optional) Regional transition altitude and flight level
- (optional) Additional remarks

Example:

LFMM_S_CTR > EU9.TS.IVAO.AERO/LFMM_S_CTR
LFMM_S_CTR > MARSEILLE CONTROLE

There is no letter designation for an Area Control Centre ATIS.

Elements extracted from a typical ATIS:

- IVAO voice server = EU9.TS.IVAO.AERO
- Channel in the voice server = LFMM_S_CTR
- Literal Name of ATC position = MARSEILLE CONTROLE

3.2. ATIS of approach, departure, tower, ground controllers

The controllers engaged to an airfield set their ATIS with the data provided for this specific airfield.

The ATIS linked to an airfield in IVAO has:

- Address of the TeamSpeak server and Channel name in the server
- Literal name of ATC position, the letter designator information and the ATIS creation time
- Airfield METAR station or the closest METAR information if the airfield does not have a unique METAR
- Landing (ARR RWY) and take-off (DEP RWY) runways
- Transition altitude (TA) and level (TRL)
- (Optional) Additional remarks
- Confirmation message with the letter designator

Example:

LFMN_APP > EU1.TS.IVAO.AERO/LFMN_APP
LFMN_APP > NICE APPROACH INFORMATION HOTEL RECORDED AT 1618Z
LFMN_APP > LFMN 061600Z 24006KT 9999 FEW060 SCT100 12/06 Q1004 NOSIG
LFMN_APP > ARR RWY 04L / DEP RWY 04R / TRL FL60 / TA 5000FT
LFMN_APP > ILS 04L APPROACH IN USE
LFMN_APP > CONFIRM ATIS INFO HOTEL ON INITIAL CONTACT

Elements extracted from this typical ATIS:

- IVAO voice server = EU1.TS.IVAO.AERO
- Channel in the voice server = LFMN_APP
- Literal Name of ATC position = NICE APPROACH
- Letter designator = HOTEL
- Time of ATIS creation = 1618Z
- METAR = LFMN 061600Z 24006KT 9999 FEW060 SCT100 12/06 Q1004 NOSIG
- Landing runway = 04L
- Take-off runway = 04R
- Transition level = FL60
- Transition altitude = 5000FT
- Additional remarks = > ILS 04L APPROACH IN USE

AIR TRAFFIC CONTROL POSITION

1. Introduction

After getting online, you will need to obtain all the information and authorizations you need to make your flight.

Some people will tell you what to do, which runway is in use, which air-routes you have to follow, give information about the weather, etc…: that is called Air Traffic Service.

Air **T**raffic **S**ervices (ATS) are managed by aeronautical regulation organizations in each country. But, IVAO manages the regulation itself in the IVAO virtual world.

2. Air Traffic Services

The aim of Air Traffic Services (ATS) is to provide pilots with one or more of the following services:

- Air Traffic Control (ATC) Services to prevent collisions and to organize traffic efficiently:
  - on taxiways, runways and in the airspace around the airfield (called Control Zone or CTR), known as Aerodrome Control service;
  - between arriving and departing aircraft in a Terminal Control Area (TMA) to and from one or more aerodromes, called Approach Control service;
  - between en-route aircraft in Control Areas (CTA) and along Airways (AWY), this is Area Control service
- Flight Information Service (FIS) by giving useful information and advice for the safe and efficient conduct of flight such as the status of navigation aids, bad weather, closed airfields etc.
- Alerting Service by assisting aircraft in difficulties and by initiating Search and Rescue (SAR).

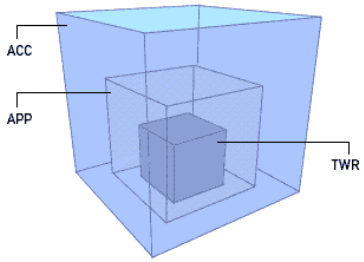
3. Air Traffic Control Units

Air Traffic Control Units have been designed to give air traffic control services. They are also responsible for giving flight information and alerting services to pilots.

The Air Traffic Control Unit that is typically responsible for:

- Aerodrome Control Service is called the Aerodrome Control Tower (TWR)
- Approach Control Service is called the Approach Control Unit (APP)
- Area Control Service is called the Area Control Centre (ACC) or Upper Area Control Centre (UAC)

The figure below shows the hierarchy of air traffic control units TWR/APP/ACC:



4. Air Traffic Control Positions in IVAO

Because of the workload in airspaces and on airport grounds, the Air Traffic Control Units are operated by one person or could be sub-divided and operated by several persons. Each of these positions is assigned distinct airspace and tasks.

The Air Traffic Control positions in the IVAO network are assigned to an ICAO airfield code or ACC airspace.
They are associated with a three letter suffix in function of their area of responsibility and service provided.

The only suffixes allowed in the IVAO network are:

- _DEL named delivery or clearance delivery
- _GND named ground
- _TWR named tower
- _APP named approach or arrival
- _DEP named departure
- _CTR named control, radar or centre
- _FSS named flight service station

Examples:
KJFK_GND = Kennedy Ground
LFKJ_APP = Ajaccio Approach
EGKK_TWR = London Gatwick Tower
EDGG_CTR = Langen Radar
LFRR_CTR = Paris Control
EHAM_DEP = Amsterdam Departure

When traffic is getting very dense, the Air Traffic Control (ATC) position can be split into several ATC positions as sub-positions according to one of the 4 main compass directions, or according to a special name of sub-position defined by an official organization or charts.

5. Delivery or Clearance Delivery Position / Suffix _DEL

The Delivery position gives to IFR aircraft their initial IFR departure clearance.

The departure clearance shall include:

- Standard departure or omnidirectional departure procedure
- Take-off runway
- Initial cleared flight level
- Squawk code.

This position is only available at bigger airports in the real world. This position is part of Aerodrome Control Services.

The clearance delivery position hands off:

- Aircraft to the ground controller after IFR clearance read-back from the pilot and before push-back

Main tasks of position:

- Give IFR departure clearances prior to startup and push-back
- Give special IFR instructions in cooperation with approach controller

Main services given:

- Air Traffic Control Service: give initial IFR departure clearance
- Traffic Information Service: None (aircraft is not moving)
- Alerting Service: None. Except if the airfield is closed

Figure: IFR aircraft on ground waiting IFR clearance

6. Ground Position / Suffix _GND

The Ground position handles aircraft on the ground, which includes all taxiways, all aprons but not runways.

The ground position hands off:

- Aircraft to the tower controller at the holding point of the departure runway.

The ground position receives:

- Aircraft from tower controller after vacating the runway.
- Aircraft from clearance delivery controller at the gate or apron.

Whenever an aircraft needs to enter or cross an active runway, this has to be coordinated with the tower controller first.

Main tasks of position:

- Give VFR flight plan clearances
- Give push-back clearances
- Give taxi clearance to departure runways
- Give taxi clearance to the terminal gate

Main services given:

- Air Traffic Control Service: give push-back clearance, taxi clearance
- Traffic Information Service: traffic information on ground to prevent collisions.
- Alerting Service: None. Except if the airfield is closed

In IVAO, the Ground controller takes clearance delivery position tasks if this position doesn't exist or this position is not connected.

Figure: Aircraft on taxiway, taxiing to main apron

7. Tower Position / Suffix _TWR

The Tower position handles aircraft on the active runway(s) and airborne aircraft that are visual with the runway within the airspace around the aerodrome. This airspace is called the Control Zone (CTR). This includes VFR traffic and helicopters.

The tower position hands off:

- IFR aircraft to the departure or approach controller after take-off at about 1000ft AGL.
- VFR aircraft to the next approach or tower controller, auto-information area when leaving his Control Zone.
- Aircraft to the ground controller after the runway has been vacated

The tower position receives:

- Aircraft at the holding point ready for take-off from the ground controller.
- IFR aircraft established on final IFR approach from the approach controller

Main tasks of position:

- Give take-off clearances
- Give landing clearances
- Give runway crossing and back-track clearances
- Give VFR integration clearances in circuit
- Give VFR orbit clearances to delay the integration clearance

Main services given:

- Air Traffic Control Service: give landing and take-off clearance and entering runway clearances.
- Traffic Information Service: traffic information between VFR/VFR and IFR/VFR as appropriate
- Alerting Service in the control Zone.

In IVAO, the Tower controller takes Ground position tasks if this position doesn't exist or this position is not connected.

Figure: One aircraft landing and another is at holding point

8. Approach Position / Suffix _APP

The Approach position normally handles arriving IFR aircraft near the Initial Approach Fix (IAF) towards the final IFR approach, VFR transit aircraft and airborne aircraft after they are handed off by the TWR until they can be transferred to the next ATC position. The approach responsibility airspace is called the Terminal Area (TMA).

The approach position can handle aircraft leaving or arriving to and from one or several airports at the same time.

The approach position hands off:

- Transit or departing aircraft to an adjacent Area Controller or nearby Approach Controller when leaving the TMA area
- Arriving aircraft to the Tower Controller after they are established on final IFR approach

The approach position receives:

- Arriving aircraft from an adjacent Area Controller to one of the airfields covered by the TMA
- Missed approach or taking-off aircraft from the Tower Controller

Main tasks of position:

- Give IFR initial, intermediate and final approach clearances
- Give radar vectoring and separates traffic using altitude, heading and speed parameters
- Make regulation clearances
- Assure adequate separation between all traffic
- Give VFR transit clearances

Main services given:

- Air Traffic Control Service: give IFR clearances and instructions including, IFR procedure, altitude, heading and speed clearances
- Traffic Information Service: traffic information between VFR/VFR and IFR/VFR as appropriate
- Alerting Service in the Terminal Area

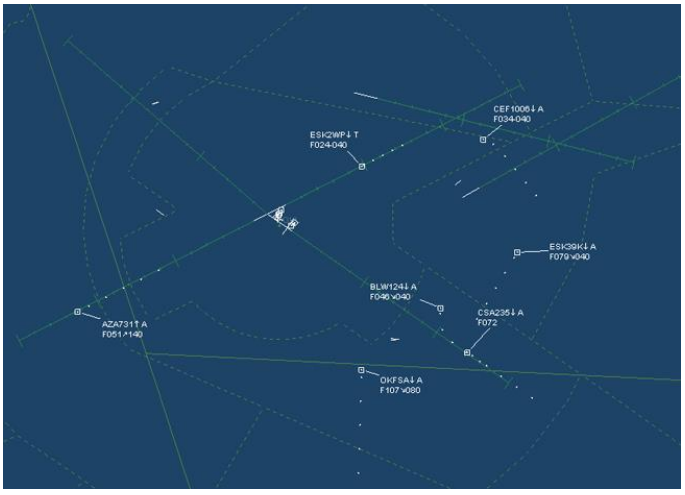


Figure: ATC approach/departure radar with 6 aircraft displayed and 3 airfields

In IVAO, the Approach controller takes Tower position tasks if this position doesn't exist or this position is not connected.
In IVAO, the Approach controller takes Departure position tasks if this position doesn't exist or this position is not connected.

At some airports, the different tasks of the approach position are split between several positions:

- Initial, Intermediate and/or Final approach positions
- Northern and southern or western and eastern approach positions
- Departure or arrival positions

Real approach airspaces are sometimes very complex and can be any combination of previously mentioned positions above.

These different positions can use an intermediate suffix :
XXXX_INI_APP, XXXX_ITM_APP, XXXX_FIN_APP
XXXX_W_APP, XXXX_E_APP, XXXX_N_APP, XXXX_S_APP
XXXX_DEP, XXXX_APP (see next chapter)

9. Departure Position / Suffix _DEP

The Departure position normally handles departing aircraft after they are airborne and handed off by the TWR until they can be transferred to the next ATC position. The departure responsibility airspace is called the Terminal Area (TMA).

The departure position should only be opened with the approach position at the same time and with a tower opened.

The departure position hands off:

- Departing aircraft to an adjacent Area Controller or nearby Approach Controller when leaving the TMA area

The departure position receives:

- Missed approach or taking-off aircraft from the Tower Controller

Main tasks of position:

- Give IFR clearances
- Give radar vectoring using altitude, heading and speed parameters
- Make departure regulation clearances
- Assure adequate separation between all traffic

Main services given:

- Air Traffic Control Service: give IFR clearances and instructions including, IFR procedure, altitude, heading and speed clearances
- Traffic Information Service: traffic information between VFR/VFR and IFR/VFR as appropriate
- Alerting Service in the Terminal Area

Figure: One departing aircraft climbing

10. Area Control Position / Suffix _CTR

The Area Control position (also named ACC) normally handles the aircraft while flying en route or climbing or descending from or into an airfield situated in its Flight Information Region (FIR). A FIR is a wide area of airspace in which Countries are responsible for the provision of the Air Traffic Services (ATS).

If there is an Upper Area Control (UAC) sector active above the normal ACC (CTR), its tasks are basically the same as for the ACC (CTR), but in the Upper Airspace. Usually, in IVAO, ACC takes care of the UAC position.

The ACC or UAC airspaces are mainly above TMA airspaces and control all IFR en-route.

The ACC position hands off:

- En-route traffic to the nearby ACC controller or UAC controller
- Inbound traffic to the Approach controller

The ACC position receives:

En-route traffic from the nearby ACC controller or UAC controller
Outbound traffic from the Approach / Departure controller

Main tasks of position:

- Give STAR/arrival route clearances
- Give directs and regulation clearances
- Give radar vectoring using altitude, heading and speed parameters
- Assure adequate separation between all traffic

Main services given:

- Air Traffic Control Service: give en-route clearances, give IFR clearance and instructions including altitude, heading, speed clearances and STAR/arrival clearances
- Traffic Information Service: traffic information between VFR/VFR and IFR/VFR as appropriate
- Traffic Information Service: traffic information between VFR/IFR and IFR/IFR
- Alerting Service in the FIR Area

In IVAO, the ACC controller can take approach position tasks if these positions are not connected. The ACC controller shall limit himself

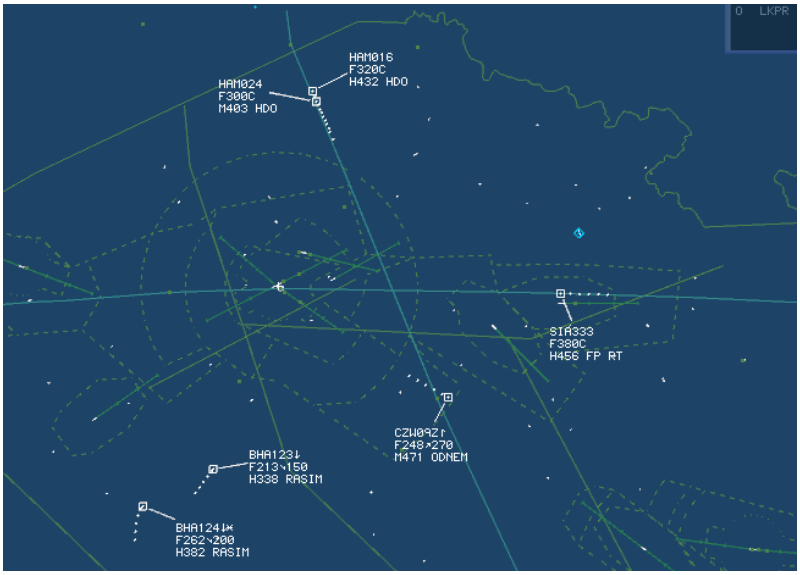


Figure: ATC ACC Radar showing en-route aircraft

11. Flight Station Services Position / Suffix _FSS

The Flight Service Station position provides Flight Information Service, search and rescue services, aircraft assistance, advises about Notices to Airmen (NOTAMs), weather conditions and Oceanic Control.

The Flight Station position hands off:

- Any traffic that will enter into controlled airspace
- En route Traffic to the nearby FSS position

The Flight Station position receives:

- En-route traffic from the nearby ACC controller or UAC controller
- Departing traffic from the Approach or Departure controller

The Flight Service Station Position does not provide any Air Traffic control and no radar services.
This position cannot give radar vectoring, climbing/descending and speed clearances or instructions, and also cannot separate traffic with clearances or instructions.

Main tasks of position:

- en route traffic information
- search and rescue services
- assists lost aircraft
- assists aircraft in emergency
- relays ATC clearances
- advises about Notices to Airmen (NOTAMs)
- broadcasts aviation weather information
- informs about the status of NAVAID's

- traffic information to VFR and IFR traffic

Main services given:

- No Air Traffic Control Service given
- Traffic Information Service: traffic information between all traffic known to him.
- Alerting Service in the FSS Area

12. Other positions and Staff Position:

In IVAO, you can see some other connections like:

- **XXXX_T_YYY**: The _T_ says that the position is a trainer session connected at XXXX airport and YYY position.
- **XXXX_X_YYY**: The _X_ says that the position is an examination session connected at XXXX airport and YYY position.
- **XXXX_EXA_YYY**: The _EXA_ says that the position is an examination session connected at XXXX airport and YYY position.
- **XXXX_YYY_OBS**: The _OBS says that the position is an observer person.

Note that all of these call signs are not active positions. As a pilot you cannot connect to their frequency and be controlled by them. You can only chat with them by private messages.

In IVAO, you can see some staff connections:

- **XXXX-CH XXXX-ACH XXXX-CHA1**: The –CH and –ACH are FIR chiefs and their assistant. They are staff members. (Example EGTT-CH, KZNY-ACH).
- **DD-XXX**: This type of call sign is reserved for division staff members. DD is the two letters that represent their division. (Example DE-FOC, BR-AOC, ZA-TC, GB-DIR)
- **IVAO-XXX**: This type of call sign is reserved for international HQ staff members. XXX represent their function in the IVAO network. (Example IVAO-TD, IVAO-DIR, IVAO-FOD, IVAO-WM).

Note: During training or examination sessions, procedures may be interrupted by the trainer or examiner. Take this into account when visiting such airports. Although IVAO encourages pilots to visit these airfields to provide them with sufficient traffic, you may expect some training limitations. The trainer or examiner may give specific instructions or have particular requests, such as staying outside the airspace or on the ground for a while when needed for training.

TRANSPONDER USE

1. Introduction

A transponder (short-for transmitter-responder) is an inboard electronic device that produces a response when it receives a radio-frequency interrogation. It assists ATC (air traffic controllers) in identifying aircrafts on a radar scope and other aircraft's collision avoidance systems.

2. Transponder in real life

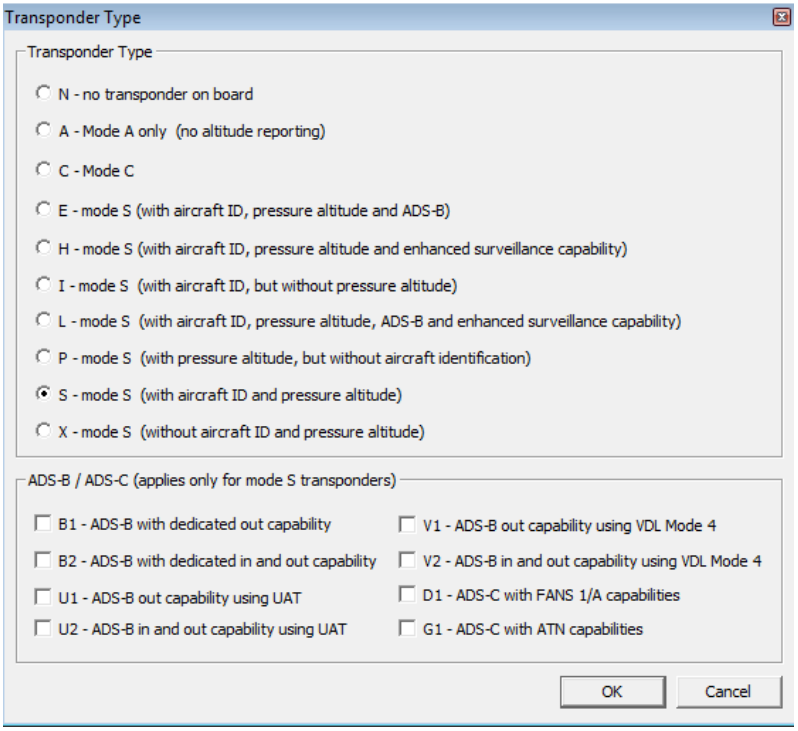
2.1. Technical description

The ATC radar sends an interrogative 1030 MHz radio frequency pulsed signal.
The aircraft answers on the 1090 MHz radio frequency with another pulsed signal.
After decoding and measuring the delay of answer, the transmitted signal is used on ATC radar to identify the aircraft (code and/or call sign) and display relevant information (azimuth, altitude, speed, flight path).

2.2. Transponder type

Several different RF communication protocols have been standardized for civilian aviation transponders. Depending on the interrogation mode, transponders can provide identification code, aircraft position, pressure altitude, call sign and other information.

Transponder types are coded using one letter and are present in the ICAO flight plan:



Description of different transponder modes:

- **Mode A** equipment transmits an identifying code only,
- **Mode C** provides identifying code and aircraft pressure altitude,
- **Mode S** (for selective) provides multiple information formats to a selective interrogation (data exchange), including the call sign - it is designed to help avoiding over interrogation and to allow automatic collision avoidance.

The transponder mode S is the most widely used mode.

2.3. Transponder settings

A transponder switch usually has several positions:

- OFF
- STBY
- ON
- ALT
- TA
- TA/RA

The "**STBY"** function will power the transponder and make it ready for operation (warming up).
The "**ON"** function (MODE A) will only send primary information to the radar that is code and position.
The "**ALT"** function (MODE C or S) will additionally transmit altitude information.
Functions such as "**TA"** and a "**TA/RA"** will provide traffic advisory and traffic advisory resolution.

2.4. Transponder IDENT

All mode A, C, and S transponders include an IDENT button, which activates a special function known as IDENT (short for identify) in order to help air traffic controllers locate an aircraft.

Squawk IDENT button on a real instrument:

2.5. Transponder codes

Transponder transmission usually uses a discrete code in order to identify the flight.

For certain type of flights and/or situations, specific transponder codes are used.

Squawk codes are four-digit octal numbers. The dials on a transponder read from **0** to **7**, inclusive.

Thus the lowest possible squawk is **0000** and the highest is **7777**. Four octal digits can represent up to 4096 different codes, which is why such transponders are often called "4096 code transponders".

There is no ‘8’ and no ‘9’ digit in transponder code.

3. Code allocation

SSR transponder code is normally allocated by each State with coordination with regional air navigation agreements and taking into account overlapping radar coverage over adjacent airspaces.

In IVAO, SSR transponder code should be allocated by division with coordination with regional air navigation agreements and taking into account the code allocation practiced in adjacent divisions.

Codes 7700, 7600, 7500 shall be reserved internationally for use by pilots encountering a state of emergency, radio communication failure or unlawful interference, respectively:

- 7700 : Emergency code
- 7600 : Radio failure code
- 7500 : Hi-jack code

Here are the description and the usage of some code attribution:

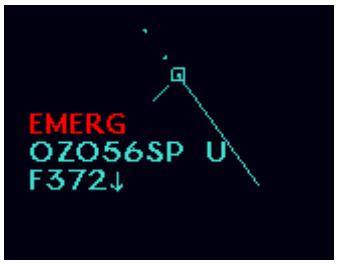
3.1.1. Transponder 7700 : the emergency code

The pilot of an aircraft in a state of emergency shall set the transponder to code 7700 unless ATC has previously directed the pilot to operate the transponder on a specified code.

The pilot shall continue to use the specified code unless otherwise advised by ATC.
If the pilot is facing a simple pan or failure, this code shall not be used.

The pilot shall not use the 7700 code outside a state of emergency.

An ATC can request a pilot to squawk 7700 if he declares an **emergency or distress** situation (**MAYDAY**).



Radar capture with aircraft using active code 7700

After the aircraft has landed, an air traffic controller should ask the pilot to set a normal code when the emergency is terminated. As a pilot, set the transponder code to 2000 or ask a new code to the air traffic controller after the emergency is terminated.

3.1.2. Transponder 7600 : the radio failure code

The pilot of an aircraft losing two-way communication shall set the transponder to code 7600.

On the IVAO network, if a pilot cannot initiate two-way communication by voice with the air traffic controller, pilot and ATC must try to communicate by text as far as possible and does not use squawk 7600.

This code is mainly used when a pilot is facing serious technical problems with his connection that cannot permit voice and text communication or for training/examination purpose.

Radar capture with aircraft using active code 7600

A controller, who notices a communication failure code, will determine the extent of the failure by instructing SQUAWK IDENT or to change the code. With that operation, if it is determined that the aircraft receiver is functioning, further control of the aircraft will be continued using code changes or IDENT transmission to acknowledge receipt of clearances.

This code shall not be used to ignore ATC clearance and contact.

3.1.3. Transponder 7500 : hi-jacking code

In real aviation, if there is unlawful interference with an aircraft in flight, the pilot-in-command shall attempt to set the transponder to code 7500 in order to indicate the situation.

The use of this code is strictly prohibited on the IVAO network. (R&R 6.4.1)
“Special operation including simulation of terrorism and act of wars are prohibited.
Although armed conflicts do exist in the real world, we do not allow the simulation of any form of aggression or violence on the IVAO network.”

Radar capture with aircraft using active code 7500

(This image was created with special authorization from a supervisor in order to make this documentation).

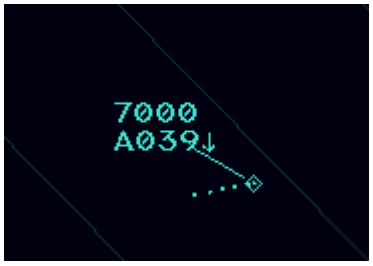
As an air traffic controller, if you observe the use of 7500 code within or outside your airspace, you should advise the pilot to change his transponder code to a new code immediately as the use of this code is forbidden in IVAO.

If the pilot continues to use this code, please call a supervisor using the .wallop command.

3.1.4. Non-controlled VFR code

Depending on local regulations, non-controlled VFR codes can change.
The most frequently codes used are:

- **1200** : USA and Canada standard squawk code
- **7000** : Europe VFR standard squawk code
- **2000** : ICAO standard squawk code



Other default codes are dependent on whether local regulations have made them available (ex 1400, 3000).

3.1.5. Non-controlled IFR code

There is one unique worldwide for non-controlled IFR flights code which is 2000.

3.1.6. Other codes

This is a list of some other codes available:

- **0000**: this code shall not be used. It is a non-discrete code. It is usually displayed on IvAp in case of some specific technical problems.
- **7777**: Non-discrete code used to test transponders and to check correctness of radar stations
- **74xx**: these codes are sometimes used for NATO special operations

4. How to use Transponder as a pilot with IvAp

When an aircraft carries a transponder, the pilot shall operate the transponder at all times during flight regardless of whether the aircraft is within or outside airspace where radar is used for air traffic service purpose (secondary surveillance radar SSR).

Pilots shall indicate the capability of the transponder aboard the aircraft in item 10 of the flight plan by inserting the appropriate letter.

Except in specific cases (see specific procedure), the pilot shall:

- Operate the transponder and select transponder code as directed by ATC unit with which contact is being made.
- Operate the transponder on code as prescribed on the basis of regional air navigation agreements
- Operate the transponder on code 2000, in the absence of any ATC unit.

Regional VFR non controlled codes are examples of prescribed codes defined by regional air navigation agreements.

When requested by ATC to confirm squawk (code), the pilot shall:

1. Verify the code setting on the transponder
2. Reselect the assigned code if necessary
3. Confirm to ATC the setting displayed on the controls of the transponder

Pilot shall not SQUAWK IDENT unless requested by ATC.

4.1. Transponder mode with IvAp

IvAp shall be considered as a type mode S transponder on IVAO network.

Other mode can be programmed when filling the flight plan using adequate letter.

4.2. Transponder status with IvAp

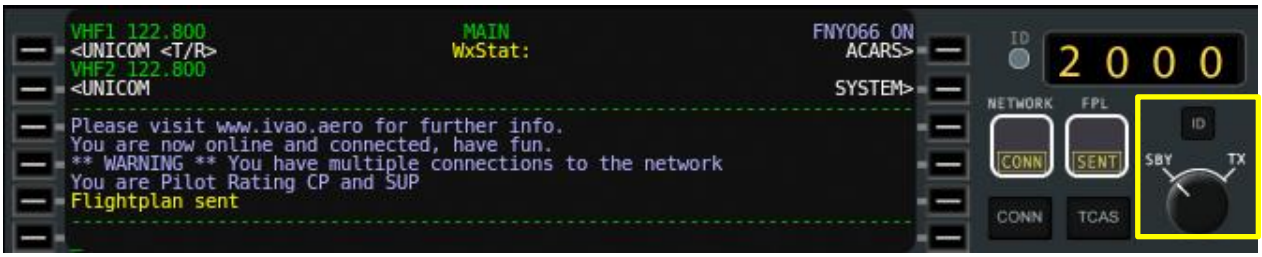
The transponder has two settings on IVAO:

- **STBY** (associated with the orange spot)
- **TX** (associated with the green spot) can be considered as **ALT real mode.**

4.3. Transponder status with x-IvAp

The transponder has two settings on IVAO:

- **STBY**
- **TX** can be considered as **ALT real mode.**



4.4. Transponder rules to follow in IVAO

All pilots must:

- Set transponder to **STDBY** position before connecting to the IVAO network
- Set transponder to **STDBY** position on apron and during taxi
- Set transponder to **TX** position when cleared entering on runway for departure, and at the latest before take-off.
- Keep transponder to **TX** position while flying all the time
- Set transponder to **STDBY** position after vacating the landing runway

As a pilot in command, you must set your transponder code yourself.

During formation flights, only the leader has to set his transponder on **TX**. The other aircrafts must maintain visual contact with the leader and will keep their transponder on the **STDBY** position.

There is no OFF mode in transponder equipment IVAO. Equipment lower position is always standby. In conclusion, you cannot disappear from the IVAO radar.
TA and TA/RA mode are simulated using the IvAp TCAS system

4.5. Transponder IDENT button

When an air traffic controller wants to locate you quickly, he can request a “transponder ident” to the pilot. The pilot accordingly will press the **IDENT** button of his IvAp interface.

Squawk IDENT button on IvAp

Note that the pilot must press the IDENT button only when requested to do a “transponder IDENT” or “SQUAWK IDENT” procedure from an air traffic controller.

4.6. Transponder code

The pilot shall tune the transponder code using the IvAp interface or instrument in the cockpit.
The air traffic controller will receive the transponder code displayed on the IvAp interface.

In phraseology, controllers use the term “squawk” before sending transponder code – for example “Squawk 2103”.

When entering a control zone, the pilot shall initiate communications with the active ATC. After first contact, the controller can assign a new transponder code. The pilot shall tune it without delay.

When leaving a control zone or when flying in uncontrolled airspace, a pilot shall tune the default transponder code in accordance with his navigation rules even if not requested by ATC.

4.6.1. Non-controlled IFR code

There is one unique worldwide for non-controlled IFR flights code which is 2000.

It is the responsibility of the pilot to setup this code when he is not inside controlled airspace.

4.6.2. Non-controlled VFR code

Depending on local R&R, several codes can be used for uncontrolled VFR flights; the most frequently used are:

- **1200** : USA and Canada standard squawk code used when no other has been assigned
- **7000** : Europe VFR standard squawk code when no other code has been assigned
- **2000** : ICAO standard squawk code and when local regulation is unknown by the pilot

If you fly outside any controlled zone, you are not allowed to tune a code given by any air traffic controller except non controlled code.

Example:
You fly IFR in Uruguay in a non-controlled zone; a Brazilian controller outside your flight zone gives you 0535 transponder code => you must **keep 2000 or tune 2000** if you forget to tune it.

You fly IFR in Uruguay in a non-controlled zone; a Brazilian controller outside your flight zone gives you 2000 transponder code => you **must tune 2000** as this is a non-controlled transponder code.

Other default codes dependant on local regulations are available (ex 1400, 3000).

5. How to handle transponder settings as an air traffic controller

In his area of control, an active controller is responsible to assign a transponder code to all aircraft.
It is the responsibility of the pilot in command to tune this transponder code in their aircraft.

To reduce pilot and controller workload and the need for controller/pilot communication, the number of code changes required of the pilot should be kept to the minimum.

5.1. Transponder code

As the system of discrete transponder codes is very complex in real aviation, there are no IVAO global rules to assign specific series of transponder codes to a specific activity or type of flight.
Outside of specific cases given in this documentation, the transponder code assignment is free.

Be aware, as ATC, you cannot assign a particular code to an aircraft outside your airspace.

Some countries have their own transponder code allocation. Contact the ATC Operations Coordinator of the related division or ATC Operations Director.

Except for aircraft in a state of emergency, or during radio communication failure, the transferring unit shall assign transponder code A2000 to a controlled flight prior to transfer of communications except before a transfer to an accepting ATC unit.

Figure showing aircraft squawking 2000 in non-controlled area after ATC transfer to Unicom.

5.2. Transponder status with IvAc

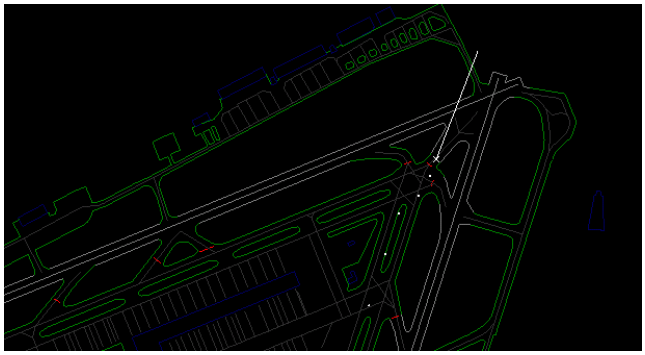
It is the responsibility of the active controller to check that a pilot correctly uses the STDBY/TX position of his transponder.

All pilots must:

- Set transponder to **STDBY** position before connecting to the IVAO network
- Set transponder to **STDBY** position on apron and during taxiing
- Set transponder to **TX** position when cleared entering on runway for departure, and at the latest before take-off.
- Keep transponder to **TX** position while flying
- Set transponder to **STDBY** position after vacating the landing runway

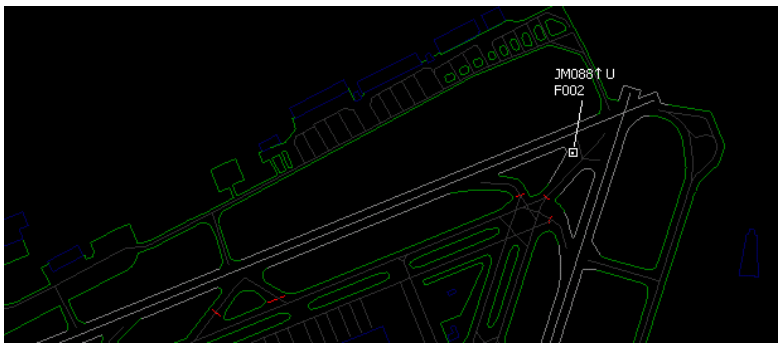
5.2.1. IvAc representation

The figure below shows an aircraft taxiing in **STBY** mode on the radar screen (no altitude is shown):



(Aircraft call sing may be displayed, depending the IvAc settings)

The figure below shows an aircraft in **TX** mode (known as ALT / ALTICODER mode) on the radar screen (altitude is shown):



There are only two representations of the transponder mode:

- **Mode A** transponder with no pressure altitude information

This representation is also valid for **N**, **X** and **I** modes. The aircraft identification is always active in IvAp.

- **Mode C** or **Mode S** transponder with pressure altitude information

This representation is also valid for **P** mode. The aircraft identification is always active in IvAp.

5.2.2. Aircraft Identification with transponder

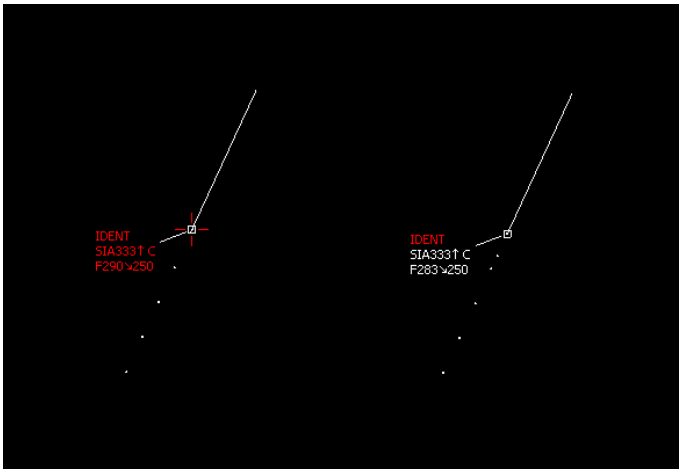
As an air traffic controller in a large zone, you may not easily locate an aircraft quickly.

In order to speed up identifying an aircraft location, the air traffic controller can use the IDENT procedure by giving a “transponder IDENT” or “squawk IDENT” command to the pilot.

When receiving a transponder IDENT request, a pilot will press the IDENT button on his instrument.
When the radar equipment receives the IDENT, it results in the aircraft's blip blinking on the radar scope.

Note that IDENT should be performed on request of ATC only.

IDENT can also be used in case of a reported or suspected radio failure to determine if the failure is only one way and whether the pilot can still transmit *or* receive, but not both, *e.g.*, "Air France 8542, if you read, squawk IDENT".



The figure shows the 2 aircraft states during the blinking IDENT on the radar screen.

CLEARANCE – INSTRUCTION – READ BACK

1. Introduction

An ATC clearance or an instruction constitutes authority for an aircraft to proceed only in so far as known air traffic is concerned and is based solely on the need to safely expedite and separate air traffic.

ATC = Air traffic controller.

Pilots are required to comply with ATC clearances and instructions accepted by them and with ATC instructions directed to and acknowledged by them, subject to the pilot maintaining final responsibility for the aircraft's safety.

Everyone shall conduct transmissions in a normal conversational tone using standard phraseology as prescribed in relevant documents or procedures.

2. Clearances and instructions

2.1. Definition

Air Traffic Control CLEARANCE: A clearance is an authorization that allows a pilot to do something.
Air Traffic Control INSTRUCTION: An instruction is an action to be executed without delay.

There is a difference between an ATC clearance and an ATC instruction:

- A clearance uses the term “cleared”
- An instruction will use an action verb in the imperative mood.

Examples of action verbs in the imperative mood:
Taxi, stop, follow, descend, climb, turn, reduce, expedite, maintain…

You may omit words such as “this is”, “over”, and other similar terms from radio transmissions provided there is no likelihood of misunderstanding.

There are other types of messages which are not clearances and instructions:

- ATC advises an expect-approach-clearance time, delay, traffic information
- ATC suggests any advice to aircraft
- ATC requests any information from an aircraft.

When the controllers use the term “expect” in communication, this is never a clearance or instruction. It’s information (or advice).
With the term “expect”, the pilot shall not proceed as if it were a clearance or instruction, but prepare his aircraft for this future instruction.

Example:
SAU2455, expect ILS approach runway 35.

Here, the pilot shall locate the ILS runway 35 approach chart and start his preparation for this approach. This communication shall not clear the pilot to the ILS approach runway 35. Pilot must hold at the last point of the previous clearance and not continue on the procedure given.

2.2. Format

Clearance shall contain positive and concise data and shall be phrased in a standard manner using phraseology.

ATC shall issue clearance items, as appropriate, in the following order:

1) Prefix.
2) Aircraft identification.
3) Clearance limit.
4) SID.
5) Route.
6) Altitude.
7) Mach-number.
8) Departure, en route, approach, or holding instructions.
9) Special instructions or information.
10) Traffic information.

2.3. Rules to know as a controller

ATC units shall issue such ATC clearances and instructions as are necessary to prevent collisions and to expedite and maintain an orderly flow of air traffic.

ATC units shall issue clearances and instructions that ensure an aircraft will remain within controlled airspace unless the aircraft requests otherwise.

ATC units shall issue clearances and instructions with the least possible delay.

ATC units shall identify and correct any error made during transmission of a clearance or instruction.
ATC units shall cancel and restate the clearance in full if there is any possibility of misunderstanding.

You may issue a clearance amending a previous clearance:

Example:
CDN92, CLEARED TO THE WINNIPEG AIRPORT VIA PRINCETON, J504 LUMSDEN, REMAINDER OF ROUTE UNCHANGED;

When a flight plan specifies that the first portion of a flight will be subject to air traffic control and the subsequent portion will be uncontrolled, the aircraft shall normally be cleared to the point at which the controlled flight terminates.

2.4. Rules to know as a pilot

If an air traffic control clearance is not suitable to the pilot-in-command of an aircraft, the flight crew may request and, if practicable, obtain an amended clearance.

ATC clearance does not constitute authorisation to violate the applicable regulations for promoting the safety of flight operation or for any other purpose.

When a flight will be partially uncontrolled, aircraft shall be advised to obtain its clearance from the ATC unit in whose area controlled the flight will be commenced.

What can I do if, as a pilot-in-command, I do not receive any further clearance?

If a clearance is not received, the aircraft is expected to hold in a published holding pattern or if there is no published pattern, a standard pattern on the inbound track to the clearance limit and to request further clearance or an approach clearance.

What can I do if, as a pilot-in-command, I cannot contact the air traffic controller? (In IVAO, by voice and by text).

If communication cannot be established with ATC, the aircraft is then expected to proceed in accordance with communication failure rules and procedures.

2.5. Clearance limit

A clearance limit shall be described by specifying the name of the appropriate significant point.

At least 5 minutes before an aircraft reaches its clearance limit, issue:

- A further clearance;
- An approach clearance
- A holding clearance.

If a clearance is not received, the aircraft is expected to hold in a published holding pattern or if there is no published pattern, a standard pattern on the inbound track to the clearance limit and to request further clearance or an approach clearance.

A late clearance may cause an aircraft to overshoot the holding fix.

When the destination aerodrome is outside controlled airspace, the ATC unit responsible for the last controlled airspace shall issue the appropriate clearance for the flight to the limit of that controlled airspace.

2.6. Route of flight

You may use the phrase “via flight planned route” provided:

- the previously filed route has not been changed
- the aircraft will be radar-monitored until past the first compulsory reporting point.

You may instruct an aircraft to follow a specified track or heading for a specified time, to a location, or to an altitude, provided the instruction does not prevent the aircraft from clearing all obstructions and terrain in accordance with the specified minimum.

Example:
PROCEED VIA/REMAIN ON (specified radial or course) UNTIL (time or location).
CLIMB/DESCEND TO (altitude) ON (specified radial or course).

You should inform a high-performance aircraft if you anticipate that it may be required to hold en route or during descent.

An ATC unit can issue, with the holding clearance, an expected approach clearance time, expected further clearance time, or the time to depart the fix, and revise it as necessary:

Example:
EXPECT APPROACH CLEARANCE AT (time); EXPECT FURTHER CLEARANCE AT (time); DEPART (fix) AT (time).

2.7. Approach clearance

An ATC unit shall specify in an approach clearance the published name of the approach as it appears in the AIP, and the route to be flown if adherence to a particular procedure is required.

Use the prefix “RNAV” in radio communications concerning RNAV(GPS) approaches.

2.8. Resolution advisory (TA/RA)

An aircraft can deviate from an ATC clearance or instruction when an ACAS/TCAS or a GPWS/TAWS resolution advisory manoeuvre occurs.
Aircraft crew that manoeuvre as a result of an ACAS/ TCAS or GPWS/TAWS RA and which may affect an ATC clearance will notify controllers when beginning the manoeuvre or as soon as workload permits.

When the ACAS/TCAS or GPWS/TAWS RA has been resolved, the aircraft crew must advise ATC they are returning to their previously assigned clearance or subsequent amended clearance.

Become aware that an aircraft has deviated from an ATC clearance or instruction as a result of an ACAS/TCAS or GPWS/TAWS resolution advisory manoeuvre.

Do not assume that other aircraft in the vicinity of an aircraft that is responding to an RA instruction are aware of its intended manoeuvres unless you are advised by them that they are also responding to an ACAS/ TCAS or GPWS/TAWS RA.

Continue to provide control instruction, safety alerts, and traffic advisories as appropriate to such aircraft.

An ATC unit shall re-assume the responsibility for separation after an aircraft has responded to an ACAS/TCAS or GPWS/ TAWS RA when the aircraft informs you that:

- the manoeuvre is complete
- it has returned to its assigned altitude
- it is following an alternate clearance

If an aircraft manoeuvers outside the limits of its clearance, the controller is not responsible for separation between it and other aircraft, protected airspace for other aircraft, terrain or obstructions.

When the ACAS/TCAS or GPWS/TAWS RA has been resolved the aircraft must advise ATC they are returning to normal situation.

3. Read back requirements

The flight crew shall read back to the air traffic controller safety-related parts of ATC clearance and instructions which are transmitted by voice (and by text for IVAO).
Read-back requirements have been introduced in the interest of flight safety.

The following shall always be read back:

- ATC route clearances
- clearances and instructions to enter, land on, take off from, hold short of, cross and backtrack on any runway
- runway-in-use, altimeter settings, SSR codes, level instructions, heading and speed instructions
- transition level

ATC advice, suggestions and requests shall not be read back.
Unless requested by an ATC unit, voice read back of a data link communication message is not required.

Strict adherence to read-back procedures ensures not only that the clearance has been received correctly, but also that the clearance was transmitted as intended.

The stringency of the read-back requirement is directly related to the possible seriousness of a misunderstanding in the transmission and receipt of ATC clearances and instructions.

ATC shall listen to the read back to ascertain that the clearance or instruction has been correctly acknowledged by the flight crew.
ATC shall identify and correct any error made during read back of a clearance or instruction.

Examples of read back:

Pilot	ATC
	DEHBA, taxi holding point runway 01
taxi holding point runway 01, DEHBA	

Pilot	ATC
	DEHBA, squawk 4525
4525, DEHBA	

If an aircraft read-back of a clearance or instruction is incorrect, the controller shall transmit the word "NEGATIVE I SAY AGAIN" followed by the correct version:

Pilot	ATC
	DEHBA, QNH 1003
QNH 1033, DEHBA	
	DEHBA, **Negative** I say again, QNH 1003
QNH 1003, DEHBA	

EuroFPL ICAO 2012 Flightplan Form Basics

1 DATE OF FLIGHT

Six-digit date of flight in the format "YYMMDD", where "YY" is the last two digits of the year, "MM" is a two-digit representation of the month, and "DD" is a two-digit representation of the calendar day (all with leading zeroes where necessary).

i.e. 121015, 130122...

2 7 AIRCRAFT IDENTIFICATION

Aircraft registration letters/tail number or an ICAO agency designator with flight number. ICAO 2012 strictly enforces that this figure should be letters and numbers only, devoid of dashes, spaces, or other punctuation.

i.e. N123B, GCABC, KLM672, SWIFT45...

3 8 FLIGHT RULES

Denotes the category of flight rules: "I" for IFR, "V" for VFR, "Y" for when the flight will be initially IFR followed by one or more subsequent flight rules changes, and "Z" for VFR first with any number of subsequent changes. When a "Y" or "Z" flight is prepared, "VFR" or "IFR must be entered in the route string wherever the transitions/changes to the flight rules are planned to occur.

i.e. Departing VFR, cruising IFR, and landing VFR? File Z.

4 TYPE OF FLIGHT

Denotes the type of flight as follows: "S" for Scheduled Air Service, "N" for Non-scheduled Air Transport Operation, "G" for General Aviation, "M" for Military, and "X" for everything else. Other special flight status and handling considerations can be relayed via the 18 OTHER INFORMATION field's "STS/" and "RMK/" indicators.

5 9 NUMBER

Number of aircraft in flight, if more than one. This figure is omitted if the flight is only a solo aircraft movement.

6 TYPE OF AIRCRAFT

Type of aircraft, as specified in the latest ICAO Doc 8643, by the appropriate designator. A search for this designator code can be performed online at:

http://www.icao.int/publications/DOC8643/Pages/Search.aspx

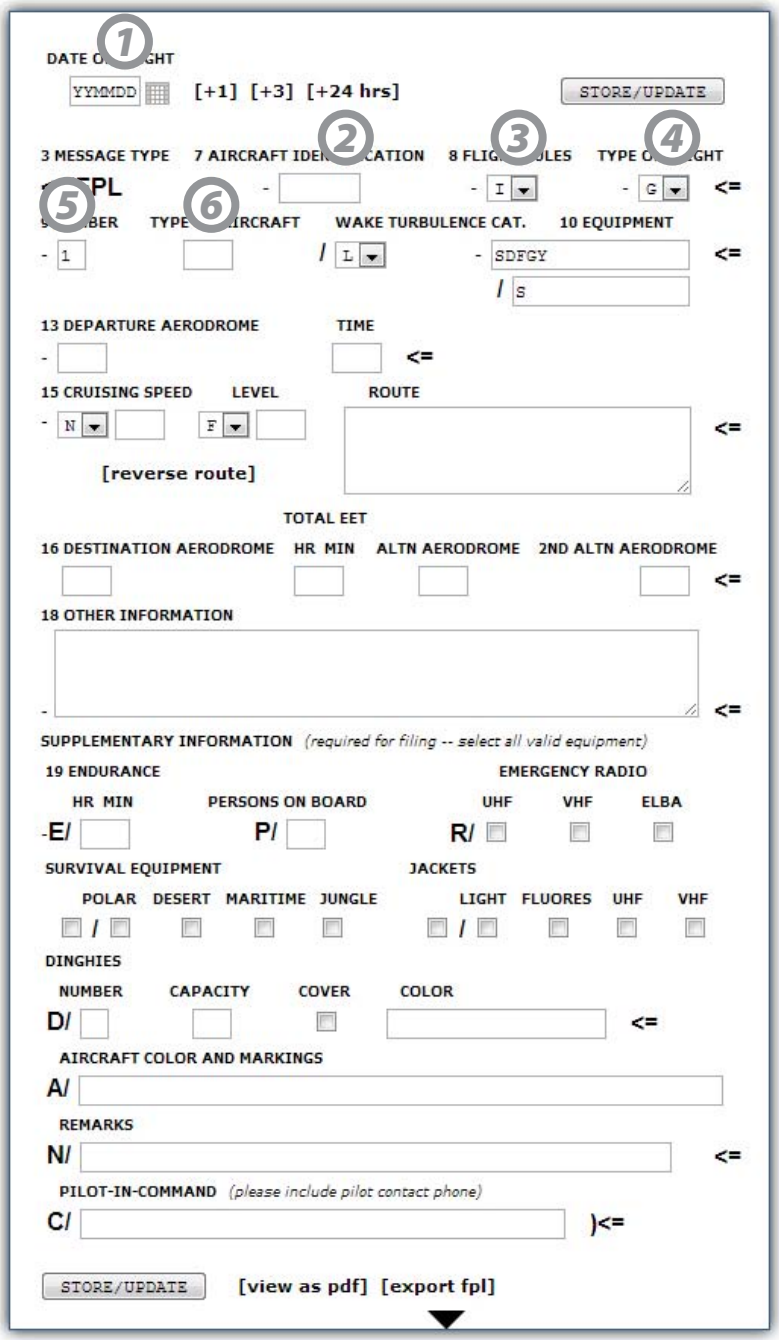
If no designator exists for your aircraft, or there is more than one type of aircraft in your flight, enter "ZZZZ" here and specify number and type(s) in 18 OTHER INFORMATION preceded by "TYP/" tags.

i.e. P46T, EA50, C182...

Did you know?

As of ICAO 2012, the date of flight (DOF/) figure is more widely recognized, and many more authorities world-wide will now accept filings as far out as five days ahead.

The [+1] [+3] and [+24 hrs] links will automatically set TIME and DATE OF FLIGHT figures 1, 3, or 24 hours ahead of the current time. If these fields aren't filled in, the system will presume a departure in one hour. If a TIME value is entered that is before, or less than 30 minutes ahead of, the current time, DATE OF FLIGHT will fill automatically with the next day's date. Otherwise, the current date will be entered.



EuroFPL ICAO 2012 Flightplan Form Basics

1 WAKE TURBULENCE CAT.

Wake turbulence category of aircraft as specified in ICAO Doc 8643 or based on weight and the following options: "L" for Light (< 7,000 kg), "M" for Medium (7,000 to 136,000 kg), "H" for Heavy (> 136,000 kg), and "J" for Jumbo (exceptionally heavy aircraft such as the Airbus A380-800). A search for the category can be performed online at:

http://www.icao.int/publications/DOC8643/Pages/Search.aspx

2 10 EQUIPMENT

The ICAO 2012 amendment includes extensive changes to the COM/NAV equipment codes used in the FPL message format. These changes and EuroFPL's helpful ICAO 2012 Equipment Wizard are explained in-depth on the next page (Page 3) of this briefing.

3 13 DEPARTURE AERODROME

Four-character location indicator of the departure aerodrome, "AFIL" if filed in the air, or "ZZZZ" if no official designator exists in ICAO Doc 7910. In the latter cases, ICAO 2012 strictly states that the aerodrome name or primary fix with location (degrees and minutes ddmmNdddmmE format preferred) be entered in 18 OTHER INFORMATION preceded by a "DEP/" tag.

i.e. EKRK, BIKF, LFPG, CYYR, ZZZZ...

4 TIME

Planned time of departure (UTC) in 24-hour "HHMM" format, where "HH" is a two-digit representation of the hour, and "MM" is a two-digit representation of the minutes past the hour (with leading zeroes where necessary).

i.e. 0615, 1342, 2305...

5 15 CRUISING SPEED

True airspeed for the initial or whole cruise segment of the flight, indicated as: "N" for Knots, followed by a four-digit figure, "M" for Mach number followed by a three-digit representation of ratio, or "K" for Kilometers/hour followed by a four-digit number.

i.e. K0830, N0485, M082...

6 LEVEL

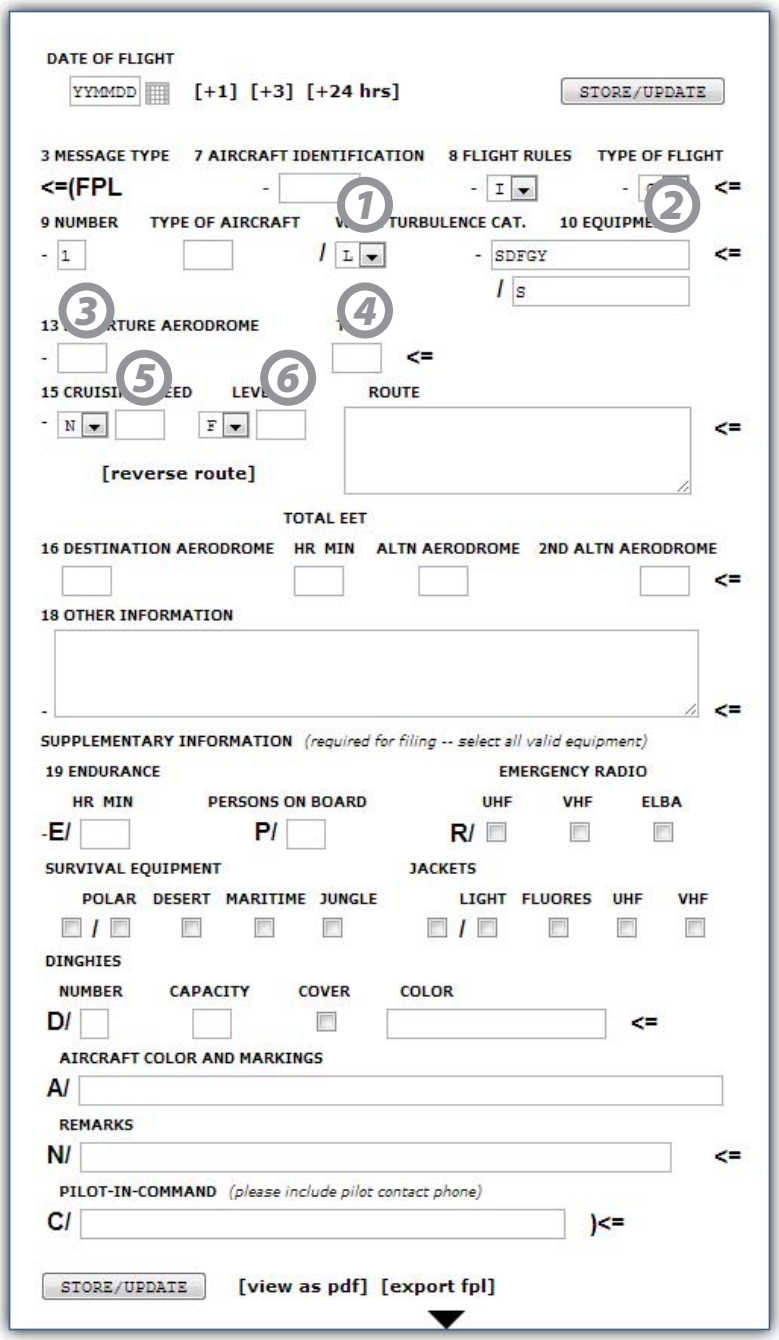
Planned cruising level for the initial or whole cruise segment of the flight, indicated as: "F" for Flight Level in 100s of feet, "A" for plain altitude in 100s of feet (both three-digit), "S" for Standard Metric Level in tens of metres, "M" for plain altitude in tens of metres (both four-digit), or "V" for uncontrolled VFR (number field left blank).

i.e. F330, M0840, A045...

Did you know?

The nature and scope of the [ICAO 2012] amendment is to update the ICAO model flight plan form in order to meet the needs of aircraft with advanced capabilities and the evolving requirements of automated air traffic management (ATM) systems, while taking into account compatibility with existing systems, human factors, training, cost and transition aspects."

ICAO State Letter (AN 13/2.1-08/50) - 25 June 2008



The Equipment Wizard aims to provide users with an organized graphical interface for the many equipment designators employed in this new format. Input can be achieved by typing codes directly into the text fields, or by selecting the checkboxes for equipment carried. NIL can be selected under either column to signify that there is no equipment and/or surveillance capability for the aircraft. Clicking the + option will reveal the various items as follows:

EuroFPL ICAO 2012 Flightplan Form Basics

10 EQUIPMENT -- EuroFPL ICAO 2012 Equipment Wizard

EQUIPMENT

VHF RTF/VOR/ILS *(S) - Standard COM/NAV Setup*
GBAS *(A) - Ground Based Augmentation System*
LPV (APV/SBAS) *(B) - Localizer Performance with Vertical Guidance (Infers Satt.-Based Augmentation)*
LORANC *(C) - LORAN-C Radionavigation*
DME *(D) - Distance Measurement Equipment*
ACARS *(Multiple) - Addressing and Reporting System*
ADF *(F) - Automatic Direction Finder*
GNSS *(G) - Global Navigation Satellite System*
GNSS augmentation "NAV/" data in Field 18 optional.
HF RTF *(H) - HF Radiotelephone*
INERTIAL NAV *(I) - Aircraft Inertial Guidance*
CPDLC *(Multiple) - Controller-Pilot Data Link*
MLS *(K) - Microwave Landing System*
ILS *(L) - Instrument Landing System*
ATC RTF SATCOM *(Multiple) - Radiotelephone Satt.*
VOR *(O) - VHF Omnidirectional Radio Range*
PBN *(R) - Performance-Based Navigation*
PBN requires corresponding "PBN/" data in Field 18.
TACAN *(T) - Tactical Air Navigation System*
UHF RTF *(U) - UHF Radiotelephone*
VHF RTF *(V) - VHF Radiotelephone*
RVSM *(W) - Reduced Vertical Separation Minimum*
MNPS *(X) - Minimum Navigation Performance Spec.*
VHF 8.33 *(Y) - 8.33 kHz Radio Channel Spacing*
OTHER *(Z) - Other Item(s) Not Listed Above*
OTHER requires corresponding "COM/", "NAV/" or "DAT".

SURVEILLANCE

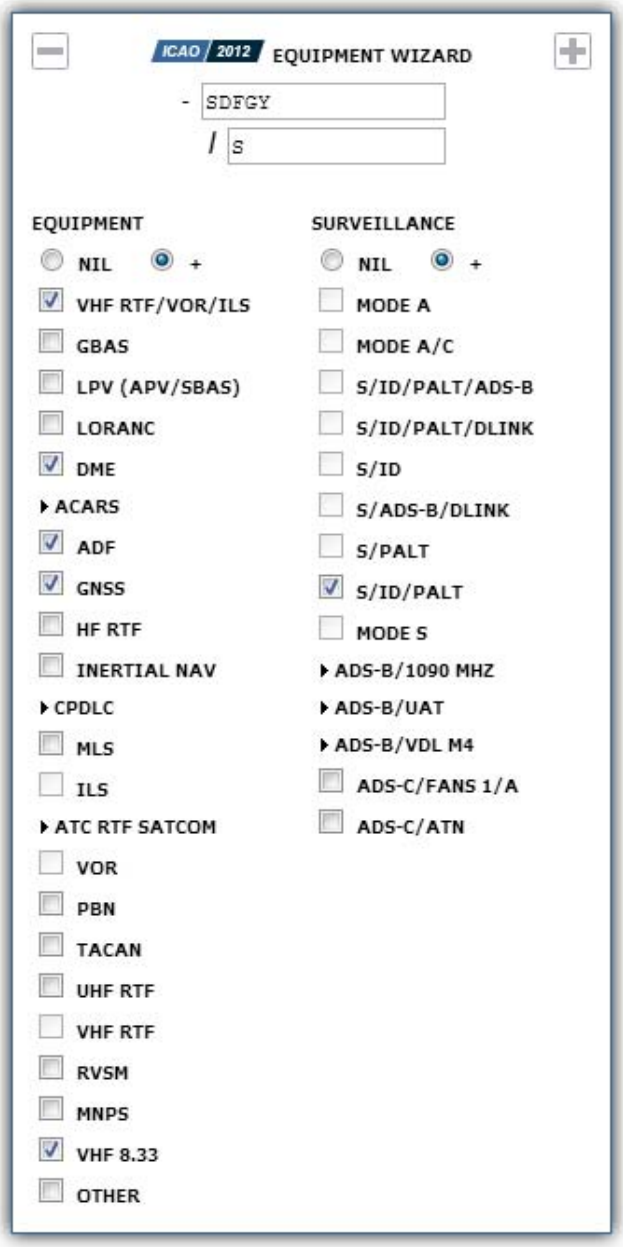
MODE A *(A) - Mode A Transponder*
MODE A/C *(C) - Mode A Transponder with Mode C*
S/[...] *(Multiple) - Mode S Transponder with or without...*
ID *- Aircraft Identification* **PALT** *- Pressure Altitude*
ADS-B *- Surveillance Broadcast* **DLINK** *- Data Link*
MODE S *(S) - Mode S Transponder*
ADS-B/1090 MHz *(Multiple) -1090 MHz Out/In*
ADS-B/UAT *(Multiple) - Universal Access Trans. Out/In*
ADS-B/VDL M4 *(Multiple) - VHF Digital Mode 4 Out/In*
ADS-C/FANS 1/A *(D1) - Sur. Contract Future Air Nav.*
ADS-C/ATN *(G1) - Sur. Contract Aeronautical Telecom*

Key Changes:

* ***New indicators added to describe complex compliment items.***
* ***The S indicator "VHF RTF/VOR/ILS" is no longer inclusive of ADF.***
* ***If "PBN" is specified, Field 18 requires corresponding "PBN/" data.***
* ***If "OTHER" is specified, Field 18 requires "COM/", "NAV/", or "DAT/".***

For a good overall online reference see also:

http://contentzone.eurocontrol.int/FPL/



EuroFPL ICAO 2012 Flightplan Form Basics

① ROUTE

A string of points (and connecting airways or DCTs where applicable) describing an ATS route or path of fixes no more than 30 minutes flying time or 200nm apart, including those points where a change of speed, level, track, or flight rules is planned. Points can be listed by their coded designator (i.e. LN, MAY, HADDY), a 7 or 11-character representation of their coordinates (i.e. 46N078W, 4620N07805W), or a point relative to a reference point based on bearing and distance (i.e. DUB190040 being 40nm out on the 190 degree magnetic bearing from DUB).

Change of speed and/or level is indicated by appending data formatted as in 15 CRUISING SPEED and LEVEL to a point, after a slash (i.e. MAY/N0305F180, 46N078W/M082F330). Change of flight rules are shown by a standalone "VFR" or "IFR" to indicate the beginning of that phase of flight.

② 16 DESTINATION AERODROME

Four-character location indicator of the destination aerodrome or "ZZZZ" if no official designator exists in ICAO Doc 7910. In the latter case, ICAO 2012 strictly states that the aerodrome name or final fix with location (degrees and minutes ddmmNdddmmE format preferred) be entered in 18 OTHER INFORMATION preceded by a "DEST/" tag.

i.e. EKRK, BIKF, LFPG, CYYR, ZZZZ...

③ TOTAL EET

Total estimated enroute time in "HHMM" format, where "HH" is a two-digit representation of the hours and "MM" is a two-digit representation of minutes in flight (with leading zeroes where necessary).

i.e. 0142, 0305, 0047...

④ (2ND) ALTN AERODROME

Four-character location indicator of the alternate aerodrome(s) or "ZZZZ" if no official designator exists in ICAO Doc 7910. In the latter case, ICAO 2012 strictly states that the aerodrome name(s) with location (degrees and minutes ddmmNdddmmE format preferred) be entered in 18 OTHER INFORMATION preceded by a "ALTN/" tag.

i.e. EKRK, BIKF, LFPG, CYYR, ZZZZ...

⑤ 18 OTHER INFORMATION

The ICAO 2012 amendment includes extensive changes to the way data is presented and ordered for Field 18 data in the FPL message format. These changes and EuroFPL's helpful ICAO 2012 Other Information Wizard are explained in-depth on the next page (Page 5) of this briefing.

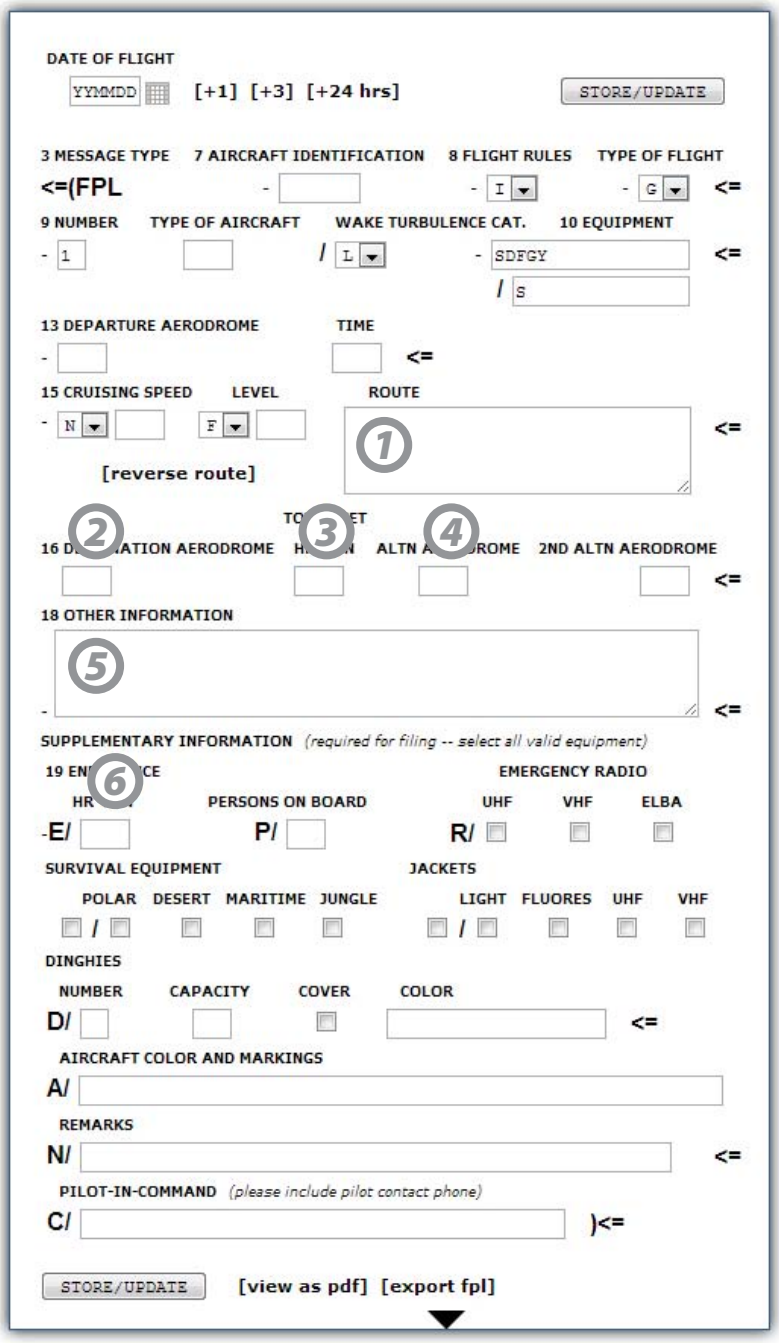
⑥ 19 ENDURANCE

Total fuel endurance in "HHMM" format, where "HH" is a two-digit representation of the hours and "MM" is a two-digit representation of minutes of fuel (with leading zeroes where necessary).

i.e. 0142, 0305, 0047...

Did you know?

If you don't enter a TOTAL EET figure, a temporary figure is automatically calculated upon STORE/UPDATE that is based on great circle distance and basic cruise speed (no winds) to allow for easy validation of the flightplan. After running a navigation log, a more accurate TOTAL EET figure can be entered along with "EET/" entries in the 18 OTHER INFORMATION field where appropriate.



The Other Information Wizard aims to provide users with an organized graphical interface for the many new designators employed in the new ICAO 2012 format. Input can be achieved by typing data directly into the text box, or by selecting an indicator type from the menu and entering data into the corresponding row. For the best success, the data fields should only contain alphanumerical characters and spaces. Other punctuation may be forbidden.

EuroFPL ICAO 2012 Flightplan Form Basics

18 OTHER INFORMATION -- EuroFPL ICAO 2012 Other Information Wizard

STS/ - *Indicators for Special Handling by ATS*

PBN/ - *RNAV and/or RNP Capability Indicators*

***EUR/** - *Protected Status Indicator for IFPS*

NAV/ - *Nav. Equipment Data and GNSS Augmentation*

i.e. NAV/SBAS

COM/ - *Comm. Equipment Not Specified in Field 10*

DAT/ - *Data Capabilities Not Specified in Field 10*

SUR/ - *Surveillance Capabilities Not Specified in Field 10*

DEP/ - *Name/Coords (ddmmNdddmmE) of Departure Aerodrome When "ZZZZ" Specified in Field 13*

i.e. DEP/CROSLAND 5337N00149W

DEST/ - *Name/Coords (ddmmNdddmmE) of Destination Aerodrome When "ZZZZ" Specified in Field 16*

i.e. DEST/VENLO 5123N00603E

REG/ - *Aircraft Registration if Different Than Field 7*

EET/ - *Estimated Enroute Time(s) in "HHMM" format to Significant Fixes or FIR Boundaries*

i.e. EET/CAP0745 EHAA0830

SEL/ - *SELCAL Code For Applicable Aircraft*

TYP/ - *Number and Type(s) of Aircraft if "ZZZZ" in Field 8*

CODE/ - *Aircraft Address Code in Six Hexadecimal Chars.*

***RVR/** - *Runway Visual Range Requirement in Metres*

DLE/ - *Enroute Delay or Holding Point with "HHMM" Time*

i.e. DLE/MDG0030

OPR/ - *ICAO Designator or Name of Aircraft Operator*

PER/ - *Aircraft Performance Category Where Applicable*

ALTN/ - *Name/Coords (ddmmNdddmmE) of Destination Alternate Aerodromes if "ZZZZ" in Field 16.*

i.e. ALTN/TOUL 4846N00558E

RALT/ - *Enroute Alternates*

TALT/ - *Take-off Alternates*

RIF/ - *Route Details to Revised Destination Aerodrome*

RMK/ - *Plain Language Remarks Where Necessary*

***STAYINFO/** - *IFPS Indicators for Stay Activity*

***RFP/** - *Replacement Flightplan Indicator for IFPS*

** For IFPS Flights Only*

Key Changes:

**** New indicators have been introduced, some retracted.***

**** The sequence that indicators should appear in is now compulsory.***

**** Any given indicator can only appear ONCE in Field 18.***

**** Hyphen (-) and oblique stroke (/) characters forbidden in data.***

**** "STS/" indicator is no longer free-text.***

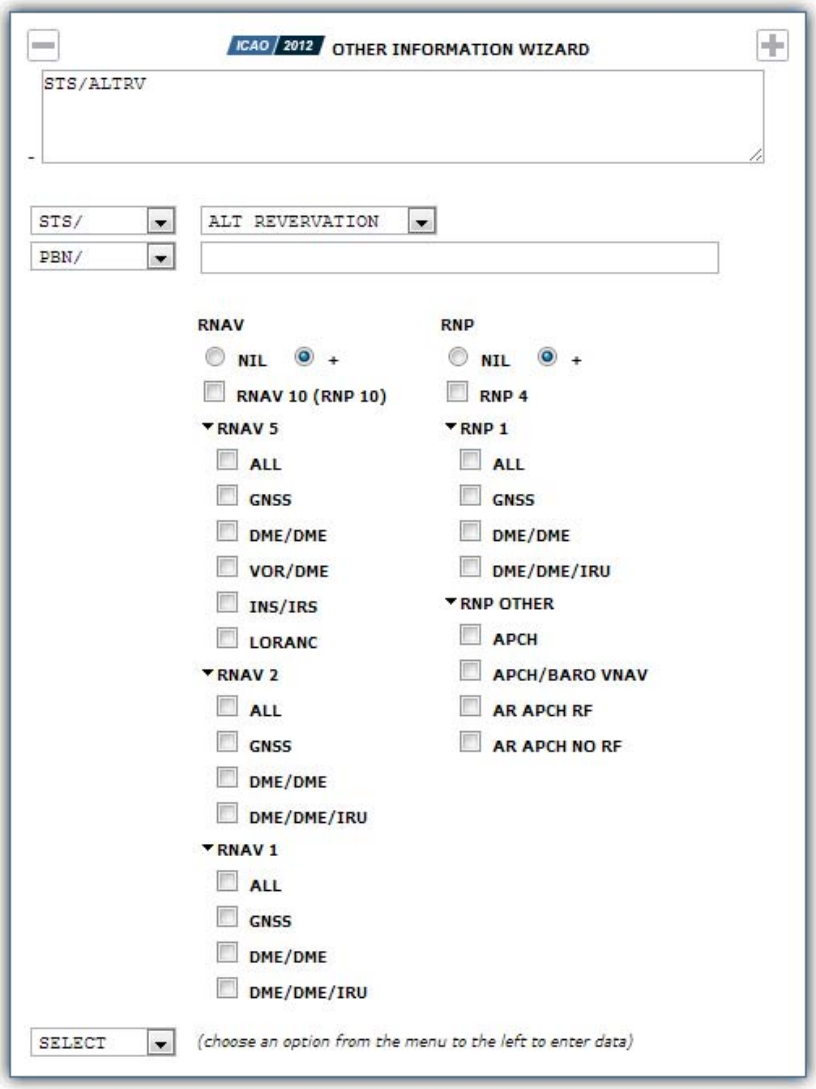
**** "PBN/" is now mandatory to detail PBN equipment capabilities.***

**** "NAV/" entry is required when GNSS equipment is specified.***

For a good overall online reference see also:

http://contentzone.eurocontrol.int/FPL/

Multiple entries of the same type will be automatically concatenated except for items such as STAYINFO entries which will be numerically sequenced in the order that they appear.



EuroFPL ICAO 2012 Flightplan Form Basics

1 PERSONS ON BOARD

Total number of persons including passengers and crew that will be onboard, or "TBN" (To Be Notified) if unknown at time of filing.

2 EMERGENCY RADIO

Please note that any available equipment or features should be CLICKED ON here. The printable PDF version of the form will reverse these selections as per the convention of crossing out equipment and features that are not available.

Select "UHF" here if you are able to receive and xmit at 243.0 MHz, "VHF" here if you are able to receive and xmit at 121.5 MHz, and/or "ELBA" if an emergency location beacon is present on the plane.

3 SURVIVAL EQUIPMENT

Please note that any available equipment or features should be CLICKED ON here. The printable PDF version of the form will reverse these selections as per the convention of crossing out equipment and features that are not available.

Select the appropriate items indicating what types of survival equipment, if any, are carried.

4 JACKETS

Please note that any available equipment or features should be CLICKED ON here. The printable PDF version of the form will reverse these selections as per the convention of crossing out equipment and features that are not available.

Select "LIGHT" if your life jacket(s) are lighting equipped, "FLUORES" if fluorescein equipped, and "UHF" or "VHF" if radio equipped.

5 DINGHIES (NUMBER)

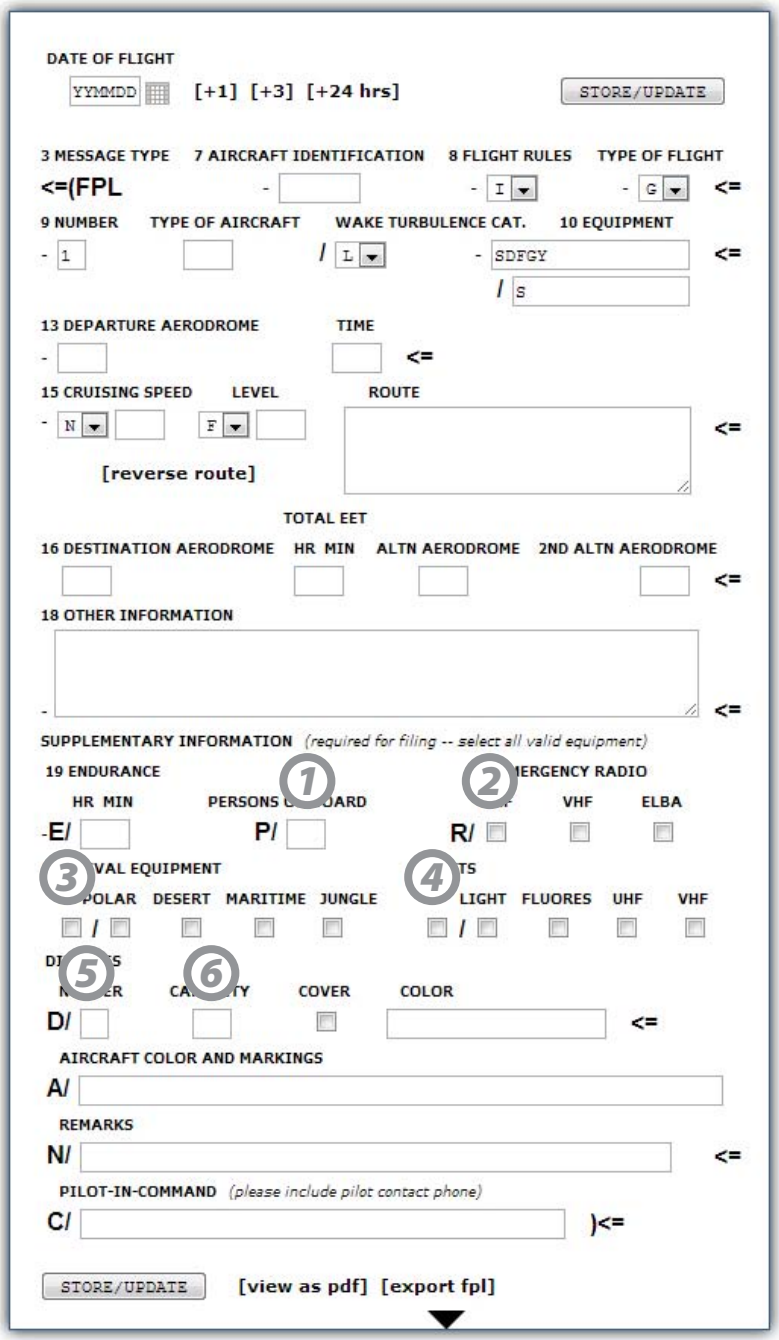
The number of survival dinghies carried onboard. Leave blank if none.

6 DINGHIES (CAPACITY)

Total capacity, in persons, of all dinghies carried. Leave blank if none.

Did you know?

Due to ICAO Doc 4444 convention and the strict nature of many authorities Flight Data Managers, flightplan supplemental data is often only transmitted to AROs and other full-service offices, and not included when transmitting directly to towers and area controllers. Because of this, it is often wise to copy your pilot contact info (phone) to an 18 OTHER INFORMATION "RMK/" entry, so that you can be contacted directly by all parties if a timely resolution is sought for any issues with your flight.



EuroFPL ICAO 2012 Flightplan Form Basics

1 DINGHIES (COVER)

Check this box if the dinghies have protective canopies.

2 DINGHIES (COLOR)

Plain text description of the dinghies primary color.

3 AIRCRAFT COLOR AND MARKINGS

Plain text description of aircraft color and any significant livery markings or characteristics.

4 REMARKS

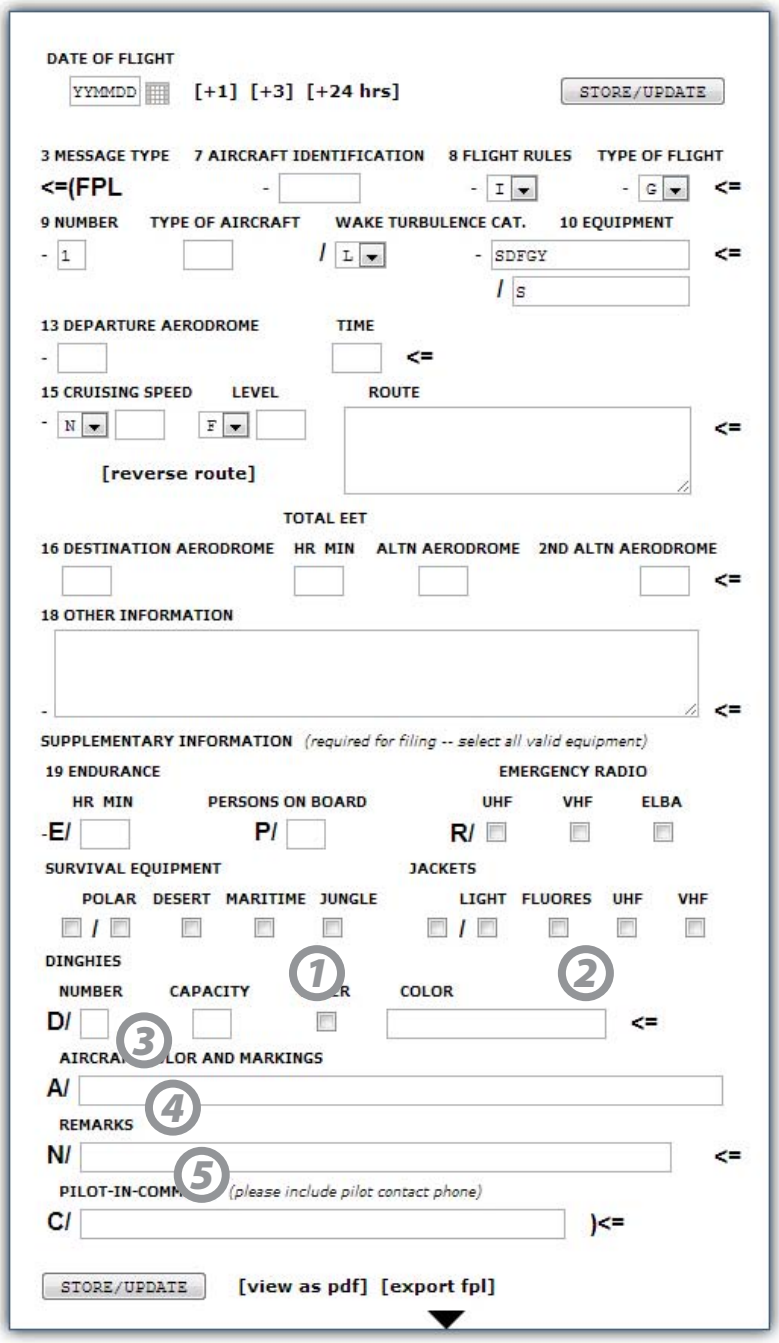
Indicate any other survival equipment carried and/or other remarks specifically regarding survival equipment and search-and-rescue (SAR) information.

5 PILOT-IN-COMMAND

Name and preferably phone contact information of the pilot in command. Including phone contact information helps in those rare cases that timely clarification or further information is required by ATC accepting the flight.

Did you know?

Custom PREFERRED CONTACT settings (such as ACK messages via SMS) for a pilot are going to be dependant on the PILOT-IN-COMMAND value attached to a flightplan. Our system will typically look to the exact value provided by the Flightplan Builder's Load Pilot menu to determine what custom contact settings to honor for an operational message. This value typically includes the pilot's surname, first initial, and mobile contact number.



INTERNATIONAL STANDARD ATMOSPHERE

1. Introduction

The ICAO Standard Atmosphere or ISA is a standard against which to compare the actual atmosphere at any point and time. (ICAO = International Civil Aviation Organization).

The real atmosphere differs from ISA in many ways. Sea level pressure varies from day to day and there are wide extremes of temperature at all levels.
Variation in pressure, vertically and horizontally, affects the operation of the pressure altimeter.

2. ISA parameters

At mean sea level, the ISA parameters are:

- Pressure = 1013.25 hPa
- Temperature = +15 °C

Each of these parameters decreases when the height from mean sea level reference increases:

- 1hPa loss each 8 meters ➔ 1hPa loss each 26.25ft
- 6.5°C loss each kilometre ➔ 1°C loss each 505ft or 15m
- When height is above 11km, the temperature is -56.6°C and constant until reaching 20km

3. Layers definition

The ISA model divides the atmosphere into layers with linear temperature distributions.

Layer	Layer name	Altitude above MSL (in km)	Lapse Rate (°C/km)	Temperature (in °C)	Atmospheric Pressure (Pa)
0	Troposphere	0.0	−6.5	+15.0	101325
1	Tropopause	11.000	+0.0	−56.5	22632
2	Stratosphere	20.000	+1.0	−56.5	5474.9
3	Stratosphere	32.000	+2.8	−44.5	868.02
4	Stratopause	47.000	+0.0	−2.5	110.91
5	Mesosphere	51.000	−2.8	−2.5	66.939
6	Mesosphere	71.000	−2.0	−58.5	3.9564
7	Mesopause	84.852	−	−86.28	0.3734

HEIGHT ALTITUDE FLIGHT LEVEL

1. Definition

There are several ways to indicate the vertical position of aircraft and/or obstacles; each has another meaning and is used in a particular situation:

- height
- altitude
- flight level

2. Units

In general, vertical positions are expressed in **FEET (ft)**.
In some parts of the World, such as in the Russian Federation and China, vertical positions are expressed in **METERS (m).**

ft (feet) is sometimes abbreviated by the sign **'** (for instance 1000' = 1000 ft).

Depending on the aircraft equipment, the **pressure altimeter** will only accept a sub-setting:

- in **hecto Pascal (hPa)**
- **Inches of Mercury (in Hg).**

Example of an altimeter with the setting displayed in inches of Mercury

Example of an altimeter showing both units of setting: (red = inHg ; blue = hPa)

Most altimeters in hPa do not show decimals. In that case, select the nearest value. If not able to select 1013,25 then, select 1013 hPa.
Some pressure altimeters show a millibar (mB) setting instead of hPa. This is not a problem since 1 mB = 1 hPa.

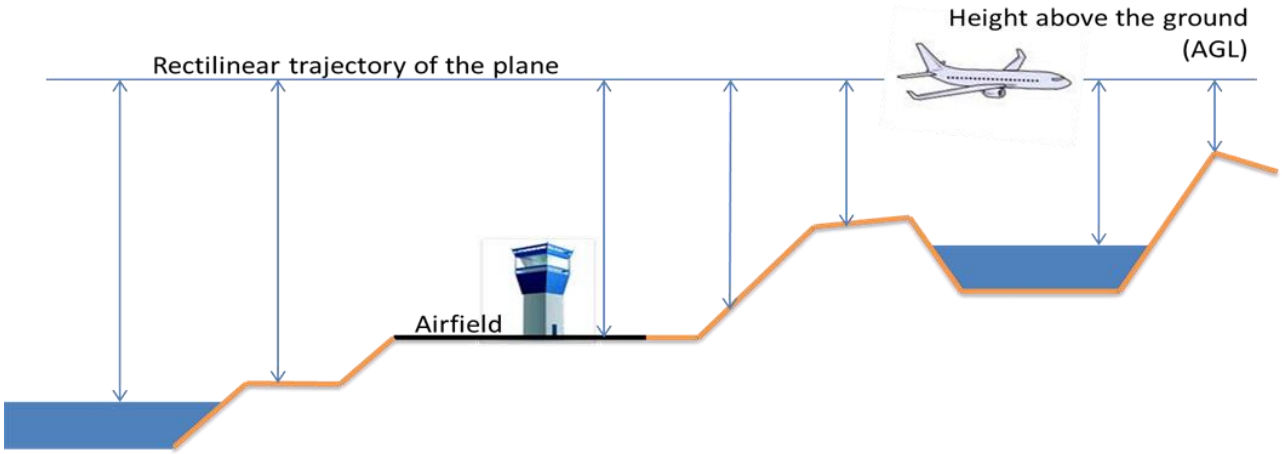
3. Height, altitude, flight level

3.1. Height and QFE

The HEIGHT is the vertical distance of an aircraft above whatever SURFACE (buildings, mountains, a lake, etc.).

QFE is the atmospheric pressure at a specified datum such as an airfield runway threshold.
When set, the altimeter reads the height above the specified datum.

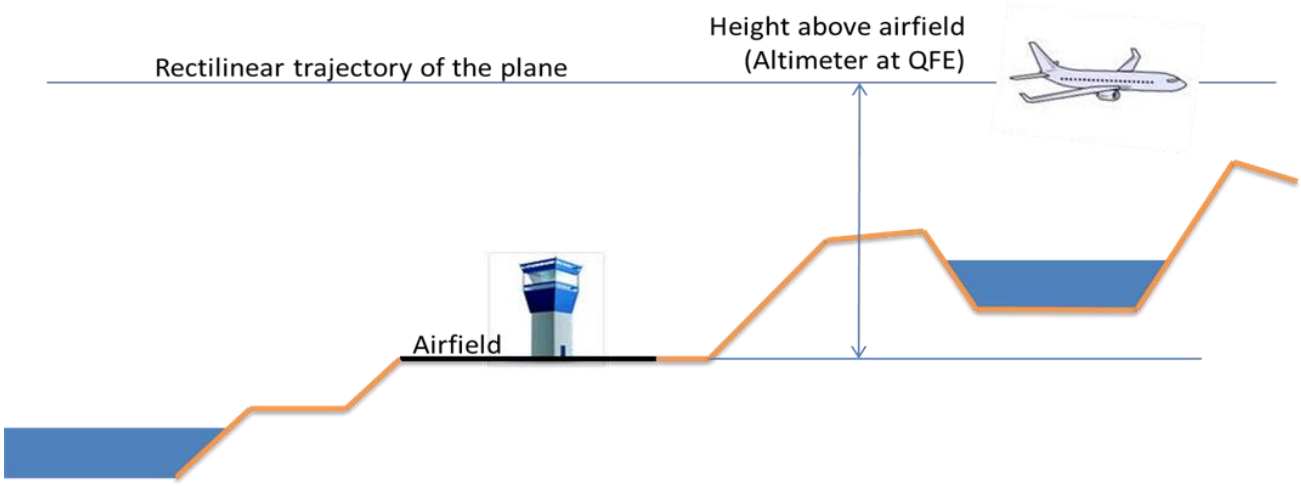
HEIGHT is expressed **in feet AGL** (Above Ground Level).



A **radio-altimeter** indicates the **HEIGHT** above whatever you are flying at that moment, not just the airport!

Example of radio altimeter

By setting the **QFE** value of an airport, the **altimeter** will show, all the time, the **HEIGHT above that airfield**. On the ground at the airfield, the altimeter will show **0 ft** (zero). The higher the airport elevation is, the lower is the QFE.



Disadvantages:
Because an airfield is often located lower or higher than the surrounding airfields, the QFE for each airfield will be quite different, even if they are a few miles apart.
Each time a pilot flies over another airfield, he has to change his altimeter sub-setting to the QFE of that airfield - not a very practical solution!

Be careful, QFE is never used to separate aircraft vertically!

3.2. Altitude, QNH and elevation

ALTITUDE (ALT) is the vertical distance of an aircraft above the MEAN SEA LEVEL (MSL).

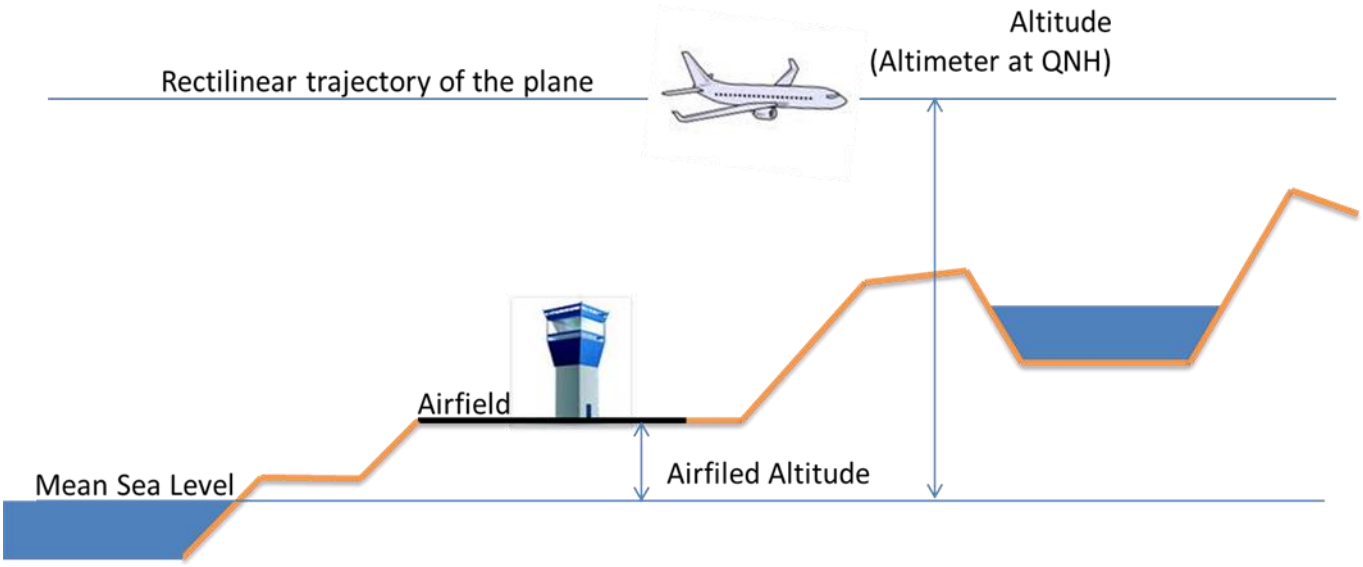
For objects and obstacles on the surface of the earth, the word ELEVATION (ELEV) is used instead of altitude.

QNH is the atmospheric pressure at mean sea level (may be either a local, measured pressure or a regional forecast pressure (RPS)). When set on the altimeter it reads altitude.

ALTITUDES and ELEVATIONS are expressed **in feet AMSL** (Above Mean Sea Level).

When an airfield QNH value is set on the aircraft's pressure altimeter, this altimeter shows **ALTITUDE**.

Example of pressure altimeter

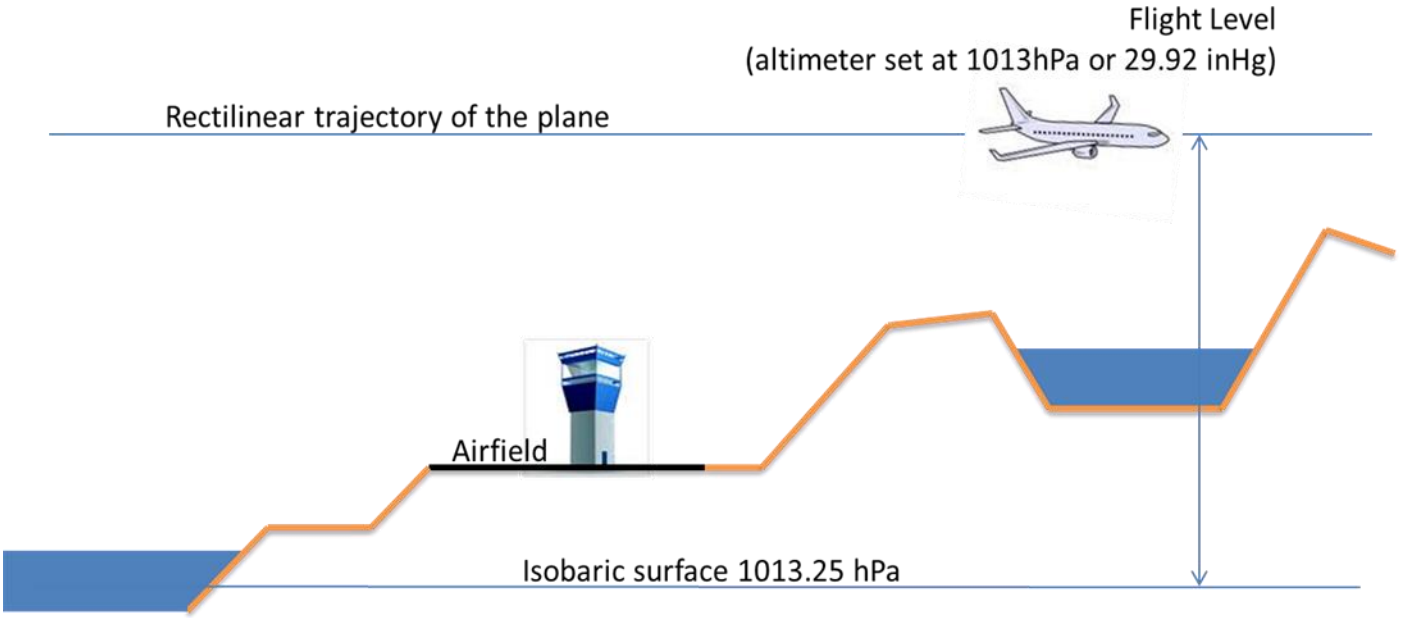


On the ground at an airport, the altimeter will (approximately) show that airfield altitude or elevation, when the aerodrome QNH is set on the aircraft's altimeter.

Commonly, the QNH altimeter setting is used worldwide at or below the transition altitude (TA) or below 3000ft AGL.

3.3. Flight level and standard pressure

A Flight Level (FL) is the vertical distance of an aircraft **above the ISOBARIC SURFACE of 1013.25hPa** (hecto Pascal) **or 29.92 in Hg** (inches of Mercury).



An **ISOBARIC SURFACE** is the **invisible landscape** that connects all points with the same atmospheric pressure. In aviation, 1013.25hPa (hector Pascal) / 29.92 in Hg (inches of Mercury) are referred to as **the STANDARD altimeter setting**.
The Flight Level is written using the two letters FL with the altitude (at standard QNH) in feet, without the two digits at the end:

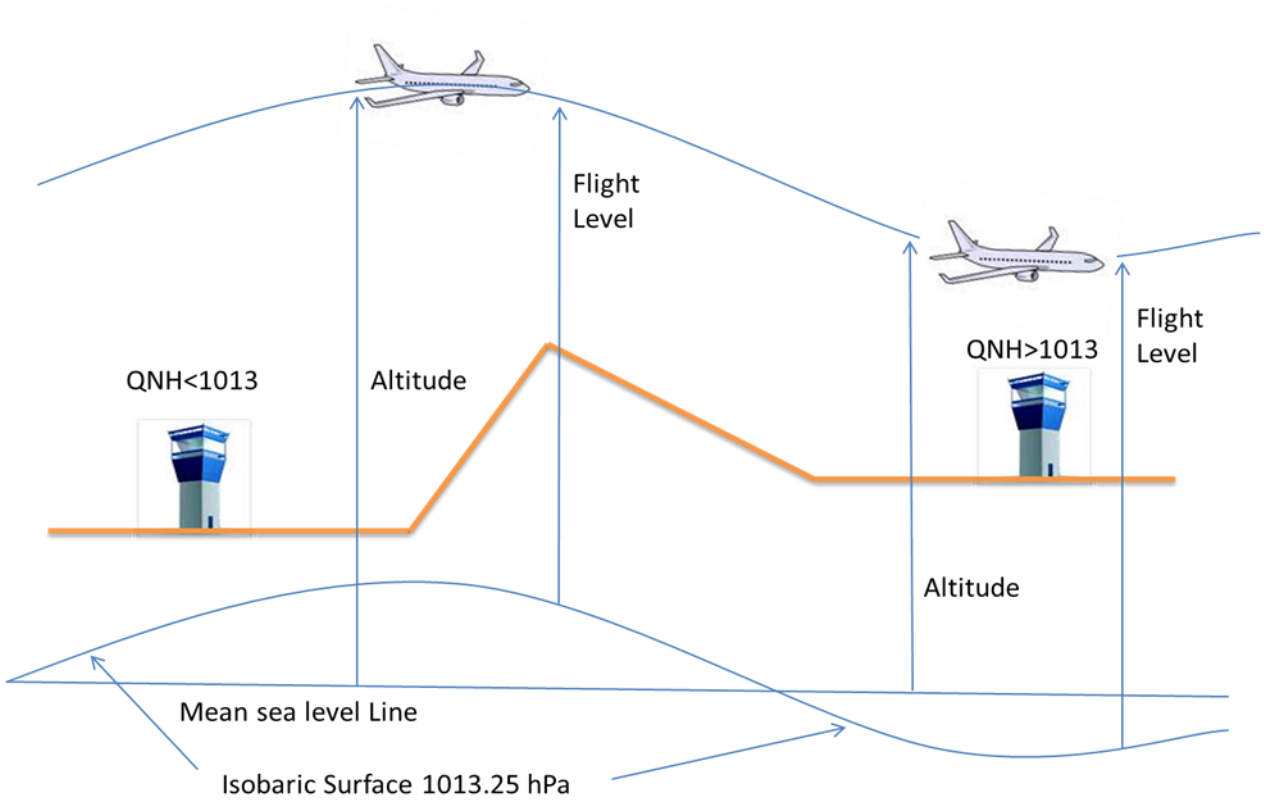
- 10000 feet becomes Flight Level 100 = FL100
- 6500 feet becomes Flight Level 65 = FL65

Commonly, the standard altimeter setting is used worldwide at or above the transition level (TL).

4. Isobaric surface curve

Because of differences in location, different airfields have different QNH values. Then, the 1013.25hPa isobaric surface is a fictive curve which can be greater or lower than the mean sea level fictive surface.

When maintaining a flight level, all aircraft have the same reference in order to maintain separation between them with that same reference, but you must know that the aircraft altitude (when following a flight level) changes slowly in conjunction with the local QNH.



SEMI-CIRCULAR RULE

1. Introduction

The semi-circular rule is the basic rule for flight level or altitude selection in function of the aircraft heading in order to ensure basic vertical separation.

1.1. Odd and even flight levels

For answering to the need of flight level separation between the same types of flight, flight levels have been separated in two categories: the even and the odd flight level:

- Even flight level: the last number before the final number 0 shall be even: FL 40, FL 60, FL 120…
- Odd flight level: the last number before the final number 0 shall be even: FL 50, FL 70, FL 130

1.2. RVSM

This semi-circular defines the available flight levels in the conventional airspace and also in the reduced vertical separation airspace (RVSM) when applicable between FL290 and FL410.

RVSM definition = reduced vertical separation minimum

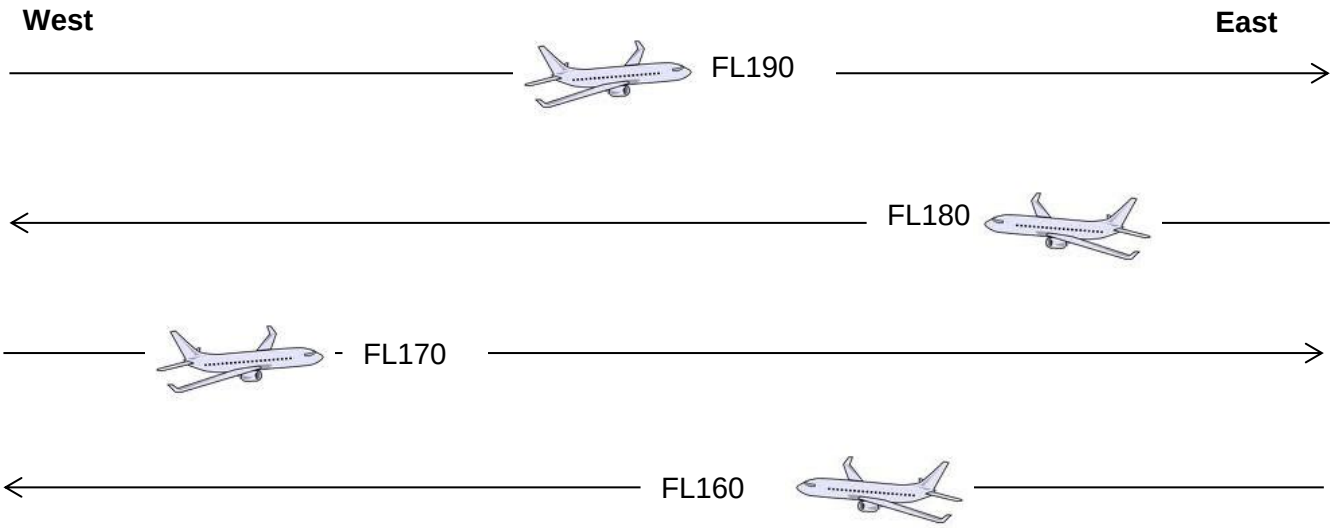
2. Default worldwide semi-circular rule

2.1. For IFR flights

The default worldwide semi-circular rule is the East/West orientation of the flight level parity:

- Your aircraft has track between **0°** and **179°**, your flight level or altitude must be **odd.**
- Your aircraft has track between **180°** and **359°**, your flight level or altitude must be **even**

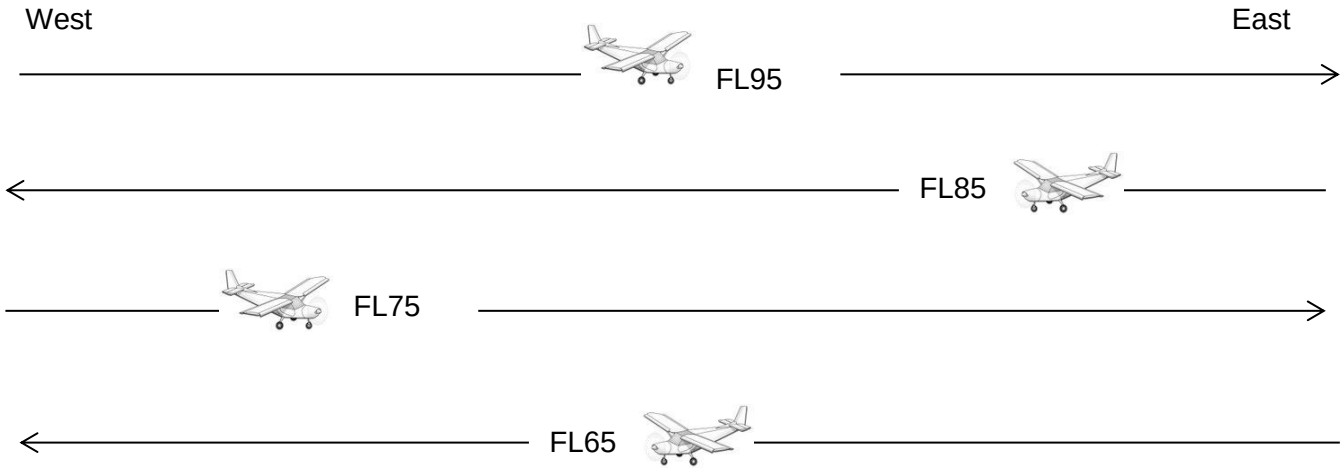
By following the semi-circular rule, an IFR aircraft will limit possible conflicts between another aircraft coming in opposite direction with providing 1000ft separation between opposite west/east tracks.



2.2. For VFR flights

The default worldwide semi-circular rule is the East/West orientation of the flight level parity:

- Your aircraft has track between **0°** and **179°**, your flight level or altitude must be **odd.**
- Your aircraft has track between **180°** and **359°**, your flight level or altitude must be **even**



By following the semi-circular rule, a VFR aircraft will limit possible conflicts between another aircraft coming in opposite direction with providing 1000ft separation between opposite west/east tracks.
The VFR rules of flight level and/or altitude selection is the same like IFR ones with adding 500ft to all levels.

3. Specific semi-circular rule

3.1. North/South rule

In some countries due to the IFR route or special regulations set by the local administration, the **semicircular rule can be the North/South** orientation of the flight level parity:

- Your aircraft has track between 90° and 269°, your flight level or altitude must be **odd**
- Your aircraft has track between 270° and 359° & between 0° and 89°, your flight level or altitude must be **even.**

3.2. Mix of rules

In some countries, (for example France), the default semi-circular rule is the east/west orientation, but national regulations publish fixed orientation of the airways that cancel the semi-circular rule where the route orientation is published. The orientation can deviate from the default definition.

Example:
In France, 95% of the airway parities are oriented North/South whenever the basic semi-circular rule is East/West.

4. List of available flight level and altitude (in feet)

4.1. In airspace below FL290 (in feet)

IFR Flight					
Track from 0° to 179°			Track from 180° to 359°		
FL	Feet	Meter	FL	Feet	Meter
10	1000	300	20	2000	600
30	3000	900	40	4000	1200
50	5000	1500	60	6000	1850
70	7000	2150	80	8000	2450
90	9000	2750	100	10000	3050
110	11000	3350	120	12000	3650
130	13000	3950	140	14000	4250
150	15000	4550	160	16000	4900
170	17000	5200	180	18000	5500
190	19000	5800	200	20000	6100
210	21000	6400	220	22000	6700
230	23000	7000	240	24000	7300
250	25000	7600	260	26000	7900
270	27000	8250	280	28000	8550
290	29000	8850	300	30000	9150

4.1. In RVSM airspace between FL290 and FL410 (in feet)

Reduced Vertical Separation Minima (RVSM) reduces the vertical separation above FL 290 and below FL410 to 1,000 ft.

This allows aircraft to safely fly more optimum routes, gain fuel savings and increase airspace capacity by adding new flight levels.

In areas where feet are used for altitude and where, in accordance with regional air navigation agreements, a vertical separation minimum of 1000 feet is applied between FL290 and FL410 inclusive.

IFR Flight					
Track from 0° to 179°			Track from 180° to 359°		
FL	Feet	Meter	FL	Feet	Meter
290	29000	8850	300	30000	9150
310	31000	9450	320	32000	9750
330	33000	10050	340	34000	10350
350	35000	10650	360	36000	10950
370	37000	11300	380	38000	11600
390	39000	11900	400	40000	12200
410	41000	12500	430	43000	13100

4.2. In non-RVSM airspace between FL290 and FL410 (in feet)

If your airspace is non-RVSM airspace, a vertical separation minimum of 2000 feet is applied between FL290 and FL410 inclusive.

For the level below FL290 and above FL410, you must select the flight level according the table in RVSM airspace.

IFR Flight					
Track from 0° to 179°			Track from 180° to 359°		
FL	Feet	Meter	FL	Feet	Meter
290	29000	600	310	31000	1200
330	33000	1800	350	35000	3000
370	37000	11300	390	39000	11900
410	41000	12500	430	43000	13100

4.3. Airspace above FL410 (in feet)

IFR Flight					
Track from 0° to 179°			Track from 180° to 359°		
FL	Feet	Meter	FL	Feet	Meter
410	41000	12500	430	43000	13100
450	45000	13700	470	47000	14350
490	49000	14950	510	51000	15550
530	etc…	etc…	550	etc…	etc…

5. List of available flight level and altitude (in meters)

5.1. In airspace below S890 (in feet)

IFR Flight					
Track from 0° to 179°			Track from 180° to 359°		
Standard Metric	Meters	Feet	Standard Metric	Meters	Feet
30	300	1000	60	600	2000
90	900	3000	120	1200	3900
150	1500	4900	180	1800	5900
210	2100	6900	240	2400	7900
270	2700	8900	300	3000	9800
330	3300	10800	360	3600	11800
390	3900	12800	420	4200	13800
450	4500	14800	480	4800	15700
510	5100	16700	540	5400	17700
570	5700	18700	600	6000	19700
630	6300	20700	660	6600	21700
690	6900	22600	720	7200	23600
750	7500	24600	780	7800	25600
810	8100	26600	840	8400	27600
890	8900	29100	920	9200	30100

5.1. In-RVSM metric airspace

In areas where metres (meter) are used for altitude and where, in accordance with regional air navigation agreements, a vertical separation minimum of 300 m is applied between 8 900 m and 12 500 m inclusive

IFR Flight					
Track from 0° to 179°			Track from 180° to 359°		
Standard Metric	Meters	Feet	Standard Metric	Meters	Feet
890	8900	29100	920	9200	30100
950	9500	31100	980	9800	32100
1010	10100	33100	1040	10400	34100
1070	10700	35100	1100	11000	36100
1130	11300	37100	1160	11600	38100
1190	11900	39100	1220	12200	40100
1250	12500	41100	1310	13100	43000

5.2. In a non-RVSM metric airspace

If your airspace is a non-RVSM airspace, a vertical separation minimum of 600 m is applied between 8 900 m and 12 500 m inclusive.

For the level below 8 900 m and above 12500 m, you must select the flight level according the table in RVSM airspace.

IFR Flight					
Track from 0° to 179°			Track from 180° to 359°		
Standard Metric	Meters	Feet	Standard Metric	Meters	Feet
890	8900	29100	950	9500	31100
1010	10100	33100	1070	10700	35100
1130	11300	37100	1190	11900	39100
1250	12500	41100	1310	13100	43000

5.1. Airspace above S1490 (in meter)

IFR Flight					
Track from 0° to 179°			Track from 180° to 359°		
Standard Metric	Meters	Feet	Standard Metric	Meters	Feet
1250	12500	41100	1310	13100	43000
1370	13700	44900	1430	14300	46900
1490	14900	48900	1550	15500	50900
etc…	etc…	etc…	etc…	etc…	etc…

AIRSPACE STRUCTURE

1. Introduction

In aeronautics, airspaces are the portion of the atmosphere controlled by a country above its territory.

There are two kinds of airspace:

- Controlled airspace is airspace of defined dimensions within which ATC service is provided to IFR flights and to VFR flights in accordance with the airspace classification.
- Uncontrolled airspace is airspace in which air traffic control does not exert any executive authority, although it may act in an advisory manner.

2. Flight information region

A Flight Information Region (FIR) is an airspace of defined dimensions within which flight information service and alerting service are provided:

- Flight Information Service: A service provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights.
- Alerting Service: A service provided to notify appropriate organizations regarding aircraft in need of search and rescue aid and to assist such organizations as required.

There is no standard size for FIRs – it is a matter of administrative convenience of the countries concerned:

- One FIR for one medium country‘s airspace
- Several FIR for one large country’s airspace
- One FIR for several small country’s airspace

In some cases there is a vertical division of the FIR, in which case the lower portion remains named as FIR, whereas the airspace above is named Upper Information Region or UIR.

An information service and alerting service are the basic levels of air traffic service, providing information pertinent to the safe and efficient conduct of flights and alerting the relevant authorities should an aircraft be in distress.

3. Controlled airspace

Controlled airspaces contain several types like, CTR, CTA, TMA, ACC …

3.1. Control zone (CTR)

A control zone named CTR or known as controlled traffic region is a controlled airspace, normally around an airport, which extends from the surface to a specified upper limit, established to protect air traffic operating to and from that airport.

This airspace is usually the airspace dedicated to a tower controller.

In certain countries, this airspace exists but it is not named CTR (like in the USA).

Do not confuse the term “CTR” with the controller position “ICAO_CTR”

3.2. Control area (CTA)

A control area named CTA is a controlled airspace that exists in the vicinity of an airport, which extends from a lower level to a specified upper level. The lower level shall not be the ground.
It usually is situated on top of a control zone and provides protection to aircraft climbing out from the airport.

A CTA can be formed by:

- Terminal control areas (TMA) of sufficient size to contain the controlled traffic around the busier aerodrome
- Interconnecting airways
- Area-type control areas which specific ATS routes have been defined for the purpose of flight planning and which provide for the organization of an orderly traffic flow.
- In the case of oceanic airspace, control areas may be achieved by the establishment of one or more route structures serving specific traffic flows.

A CTA can sit over several of the individual airports' CTRs. In larger-scale cases, this is known as a terminal manoeuvring area (TMA).

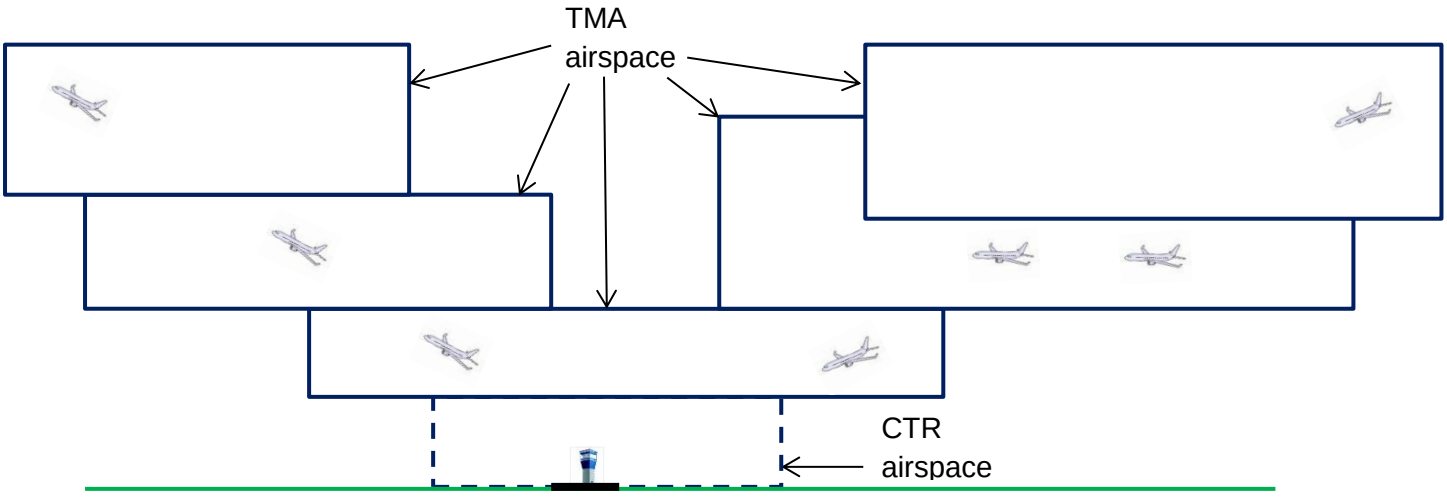
3.3. Terminal control area (TMA)

A terminal area named TMA or known as terminal manoeuvring area is a controlled airspace surrounding a major airport with a high volume of traffic.

TMA airspace is normally designed near and centred at the central major airport.

It differs from a control area or CTA in that it is divided in several levels of larger areas.

A TMA is the airspace in which approach control service is provided.



3.4. Area control centre (ACC)

An area control centre (ACC) or known as terminal manoeuvring area is a controlled airspace which extends from a lower level to a specified upper level, both levels at high altitude.

An ACC is the airspace in which en-route control service is provided to IFR flights at high altitudes between airport approaches and departures.

The airspace controlled by an en-route controller can be a flight information region or a part of it.
The U.S. equivalent facility is an air route traffic control centre (ARTCC)

Most of the area control centres are operated in IVAO by the division of the countries in which they are located.

3.5. ATS route

An ATS route is a specified route designed for channelling the flow of traffic as necessary for the provision of air traffic services.

The term “ATS route” has various meanings: airway, advisory route, controlled or uncontrolled route, arrival or departure route, etc.

An ATS route is defined by route specifications which include an ATS route designator, the track to or from significant points (waypoints), distance between significant points, reporting requirements and, as determined by the appropriate ATS authority, the lowest safe altitude.

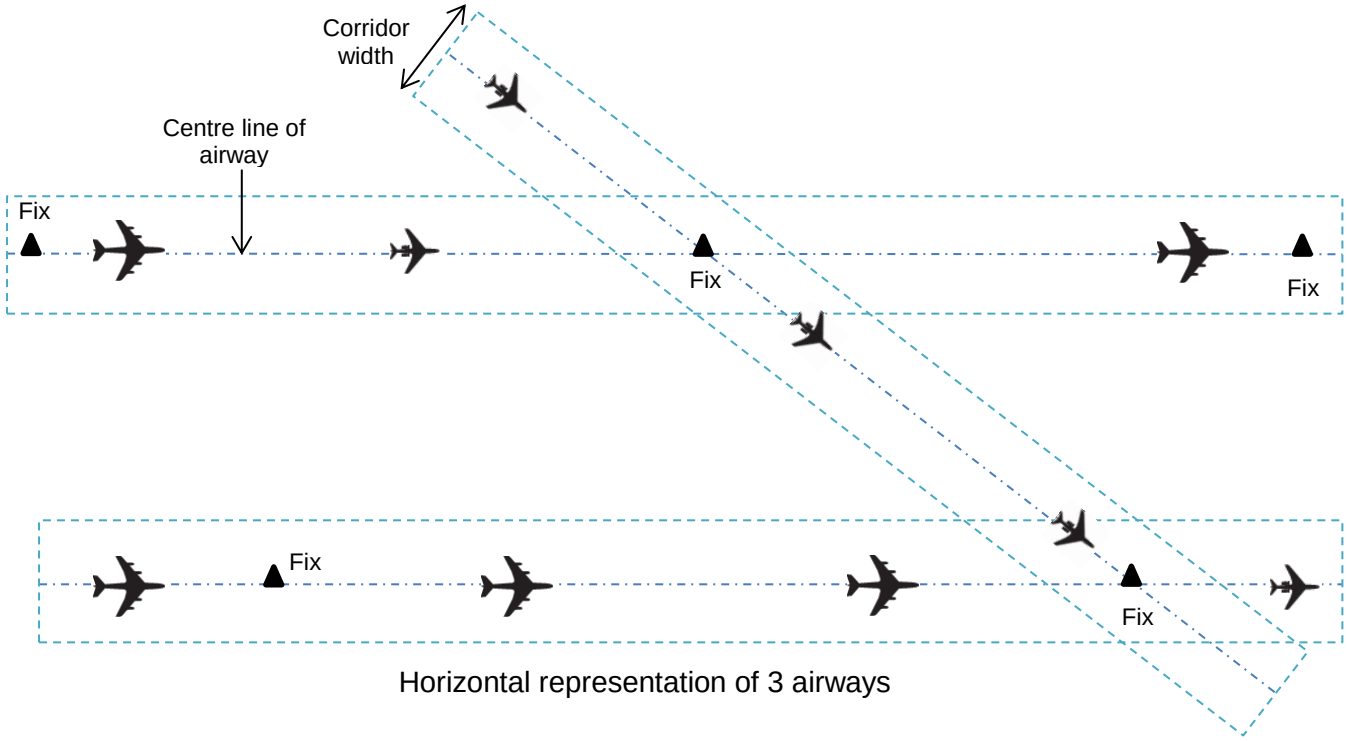
The specifications of ATS routes are published in national AIPs.

3.6. Airway

An airway or flight path is a designated route in the air.

Airways are defined segments within a specific altitude block, corridor width, and between:

- Points in airspace based on geographic coordinates named fix(es)
- Radio navigational aids (navaids) (such as VORs or NDBs)
- The intersection of specific radials of two navaids.
- The distance from a navaid using additional navaid named DME



Horizontal representation of 3 airways

4. Oceanic airspace

Oceanic airspace is an airspace located over an ocean.

Because substantial volumes of oceanic airspace lie beyond the range of ground-based radars, oceanic airspace controllers have to estimate the position of an airplane from pilot reports and computer models (procedural control), rather than observing the position directly (radar control, also known as positive control).

In addition, oceanic airspace is divided into oceanic information regions and delegated to a controlling authority bordering that region.

Pilots flying over an ocean can determine their own positions accurately using the Global Positioning System (GPS) or inertial flight system and can supply periodic updates to an oceanic controller.

In real aviation, pilots typically use high frequency (HF) radio instead of very high frequency (VHF) radio to communicate with a centre when flying over the ocean, because of HF's relatively greater propagation over long distances.
In IVAO, HF is not simulated and the use of one VHF frequency is mandatory as there is no propagation effect in IVAO.

5. Airspace restrictions and reservations

Each State can define parts of its airspace so that flights within such defined airspace are prohibited, restricted or performed with care.
Airspace restrictions can take the following form:

- Danger area
- Restricted area
- Prohibited are

These zones have their own lateral and vertical limits, and appear in the ENR (en-route) section in the AIP (Aeronautical Information Publication), coded as follows:

- XX: Country ICAO prefix code
- D/P/R: Type of restriction *('D' for Dangerous zone, 'P' for Prohibited zone and 'R' for Restricted zone)*;
- Lateral limits
- Type of restriction or danger
- Period of activation (Always activated for a prohibited zone)
- Other information

5.1. Example of restricted area in aeronautic publication

An example of a restricted area can be seen below.

LER12 CEUTA The whole Spanish dominion territory around the point 355400N 0051900W.	UNL GND/SEA	Overflying is prohibited. Permanent. Flights bound for/coming from civil and military Ceuta heliports are permitted (GECE/GECT).

In this case, it is a restricted area in Spain ('LE' stands for 'Spain' and 'R' stands for 'Restricted'). The airspace is restricted from ground or sea ('GND/SEA') to an unlimited level ('UNL'). Overflying is prohibited and it is permanently active, but civil and military flights to GECE and GECT are allowed (published requirement).

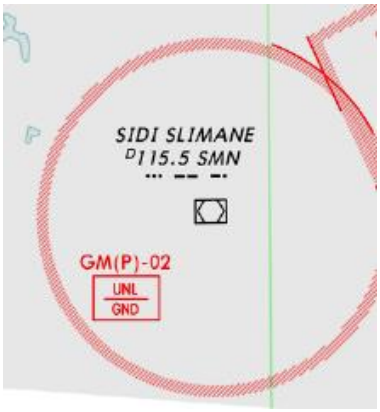
5.2. Prohibited zone

A prohibited zone (P) is an airspace of defined limits in which flying is totally prohibited (except for some authorized military and government use).

This is the most restrictive zone.

Civil flights are not allowed in these areas, except special authorization.

This red circle is the prohibited zone number 02
Starting from GND to UNLIMITED altitude

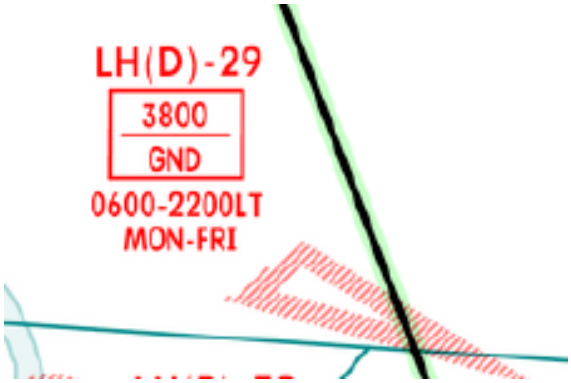


5.3. Dangerous zone

A dangerous zone (D) is an airspace of defined limits in which dangerous activities for aircraft may develop. Typical activities developed might be: test flights, parachuting, rocket-launching…

Normally, there are specific periods of time when dangerous activities take place; then, the dangerous zone is said to be 'active'. If this zone is not active, then this area can be considered as disabled and there is no danger.

This zone is the least restrictive one. It is the pilot who decides whether or not to cross an active D zone, and if crossed, safety must be ensured. If this zone is not active, there is no additional danger than in other airspaces.



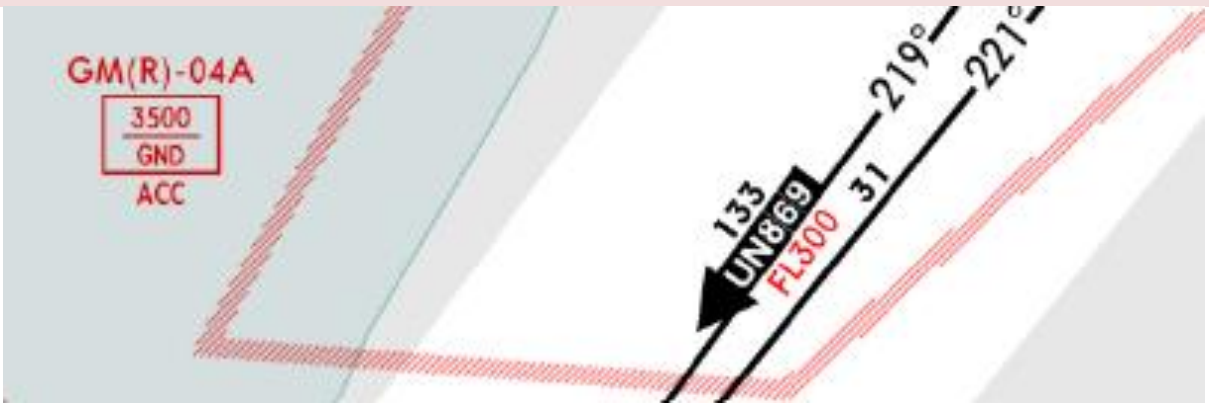
Red triangle is the dangerous zone number 29 starting from ground to 3800ft
This zone is active from Mondays to Fridays 06H to 22H local time

5.4. Restricted zone

A restricted zone (R) is an airspace of defined limits in which dangerous activities for aircraft may develop. Typical restricted zones might be zones with: training flights, military training, sensitive fauna…

Normally, there are specific periods of time when dangerous activities take place; then, the restricted zone is said to be 'active' and it must not be crossed unless complying with published requirements.

In restricted zones the pilot cannot decide whether to cross this active area or not, due to the high risk involved. The pilot can cross this area only if he received a clearance from the air traffic controller.



The red zone is a restricted area number 04A starting from GND to 3500ft

AIRSPACE CLASSES

1. Introduction

Even if the sky may appear always the same, air traffic management requires the airspace to be divided in some classes, named with the first 7 alphabetic letters (A to G).
From **A** to **G**, airspaces become less restrictive.

Each State may also establish a limited region within the airspace, extending both vertically and horizontally where flying might be prohibited, restricted or to be conducted with caution.

2. Airspace classes

In each airspace type, Air Traffic Services (ATS) provided and flight requirements change. As a rule of thumb, the best way for learning and not forget them is by noticing what is new in each airspace, regarding the previous. Below, all airspaces will be analysed.

2.1. Class A airspace

Class A airspace is a controlled airspace.

In class A airspace, IFR flights only are permitted (**No VFR flights**).

All flights are provided with air traffic control service and are separated from each other.

Type of flight	Separation provided	Services provided	Speed limit	Radio Communication	ATC clearance
IFR	Yes, between IFR	Air Traffic Control Flight Information Alerting	No	Continuous, two ways	Required
VFR	N/A	N/A	N/A	N/A	N/A

In some countries, VFR can be permitted on class A airspace with specific conditions and requirements. All exceptions are published on charts.

2.2. Class B airspace

Class B airspace is a controlled airspace.
In class B airspace, IFR and VFR flights are permitted.

All flights are provided with air traffic control service and are separated from each other.

Type of flight	Separation provided	Services provided	Speed limit	Radio Communication	ATC clearance
IFR	Yes, between IFR and between IFR and VFR	Air Traffic Control Flight Information Alerting	No	Continuous, two ways	Required
VFR	Yes, between VFR and between VFR and IFR	Air Traffic Control Flight Information Alerting	No	Continuous, two ways	Required

2.3. Class C airspace

Class C airspace is a controlled airspace.
In class C airspace, IFR and VFR flights are permitted.

All flights are provided with air traffic control service and IFR flights are separated from other IFR flights and from VFR flights. VFR flights are separated from IFR flights and receive only traffic information with respect to other VFR flights.

Type of flight	Separation provided	services provided	Speed limit	Radio Communication	ATC clearance
IFR	Yes, between IFR and between IFR and VFR	Air Traffic Control Flight Information Alerting	No	Continuous, two ways	Required
VFR	Yes, between VFR and IFR Only Traffic Information between VFR	Air Traffic Control Flight Information Alerting	250KT Below 10000ft/ FL100	Continuous, two ways	Required

2.4. Class D airspace

Class D airspace is a controlled airspace.
In class D airspace, IFR and VFR flights are permitted.

All flights are provided with air traffic control service, IFR flights are separated from other IFR flights and receive traffic information with respect to VFR flights, VFR flights receive traffic information with respect to all other flights.

IFR aircraft are separated from VFR ones, but VFR aircraft are not separated from IFR ones.
VFR needs not to be separated from IFR but they receive traffic information. The responsibility for separation is given to the VFR pilot.

This is known as essential traffic, which by definition means: controlled traffic to which ATC separation is applicable (in this case, IFR traffic) that is not or will not be separated from other particular controlled traffic (in this case, VFR traffic) by the appropriate separation minima.

Type of flight	Separation provided	Services provided	Speed limit	Radio Communication	ATC clearance
IFR	Yes, between IFR only Traffic Information between IFR and VFR	Air Traffic Control Flight Information Alerting	250KT Below 10000ft/ FL100	Continuous, two ways	Required
VFR	Only Traffic Information between VFR and between VFR and IFR	Air Traffic Control Flight Information Alerting	250KT Below 10000ft/ FL100	Continuous, two ways	Required

Note that a special VFR shall be separated from other traffic like IFR ones.
Special VFR flight is known as a VFR flight cleared by air traffic control to operate within a control zone in meteorological conditions below VMC.
Note that special VFR rule exists only in some countries. Consult your country regulation publication if you are permitted to use this special rule.

2.5. Class E airspace

Class E airspace is a controlled airspace.
In class E airspace, IFR and VFR flights are permitted.

IFR flights are provided with air traffic control service and are separated from other IFR flights. All flights receive traffic information as far as is practical. Class E shall not be used for control zones.

Type of flight	Separation provided	Services provided	Speed limit	Radio Communication	ATC clearance
IFR	Yes, between IFR only Traffic Information between VFR and IFR	Air Traffic Control Flight Information Alerting	250KT Below 10000ft/ FL100	Continuous, two ways	Required
VFR	Only Traffic Information between VFR and between VFR and IFR	Flight Information Alerting	250KT Below 10000ft/ FL100	Not required	Not Required

2.6. Class F airspace

Class F airspace is a non-controlled airspace.
In class F airspace, IFR and VFR flights are permitted.

IFR and VFR flights are permitted, all participating IFR flights receive an air traffic advisory service and all flights receive flight information service if requested.

Type of flight	Separation provided	Services provided	Speed limit	Radio Communication	ATC clearance
IFR	Traffic Information between VFR and IFR	Flight Information Alerting	250KT Below 10000ft/ FL100	Continuous, two ways	Not Required
VFR	No separation	Flight Information on request Alerting	250KT Below 10000ft/ FL100	Not required	Not Required

In some countries this airspace does not exist.
A non-controlled airspace is not equal to airspace without air traffic controllers.

2.7. Class G airspace

Class G airspace is a non-controlled airspace.
In class G airspace, IFR and VFR flights are permitted.

IFR and VFR flights are permitted and receive flight information service if requested.

Type of flight	Separation provided	Services provided	Speed limit	Radio Communication	ATC clearance
IFR	No separation Traffic Information between VFR and IFR on request	Flight Information on request Alerting	250KT Below 10000ft/ FL100	Continuous, two ways	Not Required
VFR	Traffic Information between VFR and IFR on request	Flight Information on request Alerting	250KT Below 10000ft/ FL100	Not required	Not Required

A non-controlled airspace is not equal to airspace without air traffic controllers.

AIRSPACE CLASS TABLE

Class	Type of flight	Separation Provided	Services Provided	Speed limit	Radio Communication	ATC clearance
A	**IFR**	Yes, between IFR	Air Traffic Control Flight Information Alerting	No	Continuous, two ways	Required
	VFR	N/A	No service to VFR	N/A	N/A	N/A
B	**IFR**	Yes, between IFR	Air Traffic Control	No	Continuous, two ways	Required
	VFR	Yes, between VFR and between VFR and IFR	Air Traffic Control Flight Information Alerting	No	Continuous, two ways	Required
C	**IFR**	Yes, between IFR and between IFR and VFR	Air Traffic Control Flight Information Alerting	No	Continuous, two ways	Required
	VFR	Yes, between VFR and IFR Only Traffic Information between VFR	Air Traffic Control Flight Information Alerting	250KT Below 10000ft/FL100	Continuous, two ways	Required
D	**IFR**	Yes, between IFR only Traffic Information between IFR and VFR	Air Traffic Control Flight Information Alerting	250KT Below 10000ft/FL100	Continuous, two ways	Required
	VFR	Only Traffic Information between VFR and between VFR and IFR	Air Traffic Control Flight Information Alerting	250KT Below 10000ft/FL100	Continuous, two ways	Required
E	**IFR**	Yes, between IFR only Traffic Information between VFR and IFR	Air Traffic Control Flight Information Alerting	250KT Below 10000ft/FL100	Continuous, two ways	Required
	VFR	Only Traffic Information between VFR and between VFR and IFR	Flight Information Alerting	250KT Below 10000ft/FL100	Not required	Not Required
F	**IFR**	Traffic Information between VFR and IFR	Flight Information Alerting	250KT Below 10000ft/FL100	Continuous, two ways	Not Required
	VFR	No separation	Flight Information on request Alerting	250KT Below 10000ft/FL100	Not required	Not Required
G	**IFR**	Traffic Information between VFR and IFR	Flight Information Alerting	250KT Below 10000ft/FL100	Continuous, two ways	Not Required
	VFR	No separation	Flight Information on request Alerting	250KT Below 10000ft/FL100	Not required	Not Required

RULES OF THE AIR

1. Summary

This article presents the rules of the air applicable to all aircraft.

2. Applicability of the rules of the air

2.1. Flight rules

The operation of an aircraft either in flight or on the movement area of an aerodrome shall be in compliance with the general rules and, in addition, when in flight, must comply with either visual flight rules or instrument flight rules.

VFR is the acronym of Visual Flight Rules.
IFR is the acronym of Instrument Flight Rules.

A pilot may elect to fly in accordance with instrument flight rules in visual meteorological conditions or may be required to do so by the appropriate ATS authority.

2.2. Responsibility of the pilot in command

The pilot-in-command of an aircraft shall, whether manipulating the controls or not, be responsible for the operation of the aircraft in accordance with the rules of the air.

The pilot-in-command may depart from these rules in circumstances that render such departure **absolutely necessary in the interest of safety**.

The pilot-in-command of an aircraft shall have **final authority** as to the disposition of the aircraft while in command.

2.3. Pre-flight action

Before beginning a flight, the pilot-in-command of an aircraft shall become familiar with **all available information appropriate** to the intended operation.

Pre-flight action for flights away from the vicinity of an aerodrome, and for all IFR flights, shall include a careful study of:

- Current **weather reports and forecasts**
- **Fuel requirements** and an alternative course of action if the flight cannot be completed as planned.

3. General Rules

3.1. Minimum height, altitude and flight Level

Except for take-off or landing, aircraft shall not be flown over the congested areas of cities, towns or settlements or over an open-air assembly of persons.

The cruising levels/altitudes at which a flight to be conducted shall be in terms of:

- **Flight levels**, for flights at or above the lowest usable flight level or, where applicable, above the transition altitude;
- **Altitudes**, for flights below the lowest usable flight level or, where applicable, at or below the transition altitude.

3.2. Formation flight

Aircraft shall not be flown in formation except by prearrangement among the pilots-in-command of the aircraft taking part in the flight and in accordance with the conditions prescribed by an air traffic controller.

These conditions shall include all the following:

- **The formation operates as a single aircraft** with regard to navigation and position reporting.
- **The separation between aircraft in the flight shall be the responsibility of the flight leader** and the pilots-in-command of the other aircraft in the flight
- **A distance not exceeding 1 km (0.5 NM)** laterally and longitudinally and **30 m (100 ft)** vertically from the flight leader shall be maintained by each aircraft

3.3. Prohibited areas

Aircraft shall not be flown in a prohibited area, or in a restricted area, the particulars of which have been duly published, except in accordance with the conditions of the restrictions or by permission of the State over whose territory the areas are established.

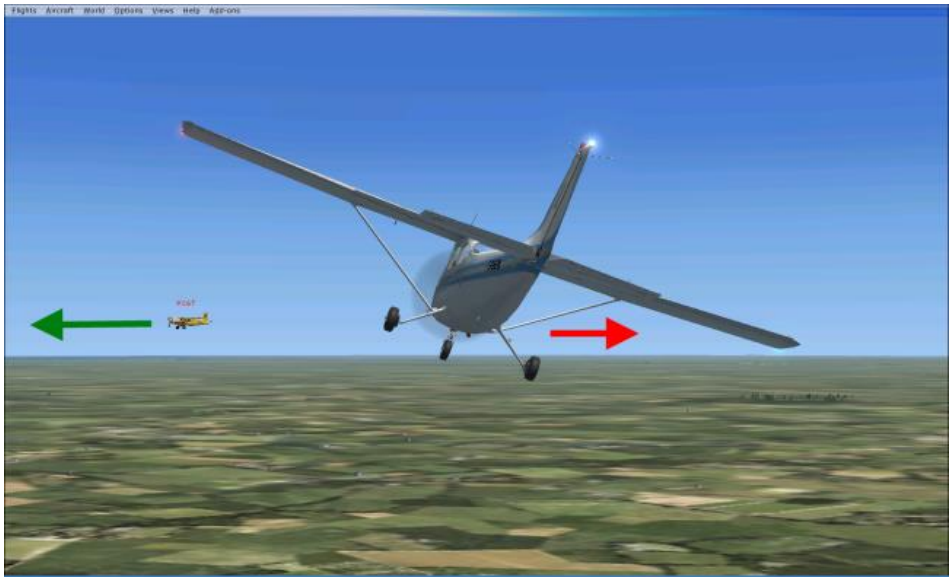
3.4. Avoidance of collisions

An aircraft shall not be operated in such proximity to other aircraft as to create a collision hazard.

3.4.1. Right priority

When two aircraft are converging at approximately the same level, the aircraft that has the other on its right shall give way.

When two aircraft are approaching head-on or approximately so and there is danger of collision, each shall alter its heading to the right.



The aircraft that has the right-of-way shall maintain its heading and speed.

The exceptions are:

- **Power-driven** heavier-than-air aircraft shall give way to airships, gliders and balloons
- **Airships** shall give way to gliders and balloons
- **Gliders** shall give way to balloons
- Power driven aircraft shall give way to aircraft which are seen to be towing other aircraft or objects.

3.4.2. Overtaking priorities

An overtaking aircraft is an aircraft that approaches another from the rear on a line forming an angle of less than 70 degrees.

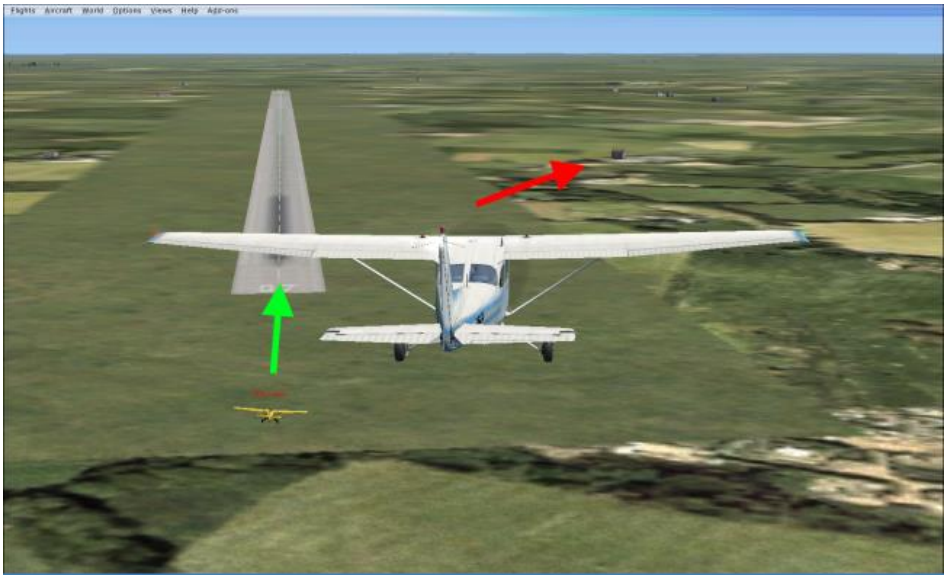
An aircraft that is being overtaken has the right-of-way and the overtaking aircraft, whether climbing, descending or in horizontal flight, shall keep out of the way of the other aircraft by altering its heading to the right.

3.4.3. Landing and take-off priorities

An aircraft in flight, or operating on the ground or water, shall give way to aircraft landing or in the final stages of an approach to land.

An aircraft taxiing on the manoeuvring area of an aerodrome shall give way to aircraft taking off or about to take off.

An aircraft that is aware that another is compelled to make an emergency landing shall give way to that aircraft.
When two or more aircraft are approaching an aerodrome for the purpose of landing, aircraft at the higher level shall give way to aircraft at the lower level, but the latter shall not take advantage of this rule to cut in front of another which is in the final stages of an approach to land, or to overtake that aircraft. Nevertheless, power-driven heavier-than-air aircraft shall give way to gliders.



3.4.4. Ground movements

In case of danger of collision between two aircraft taxiing on the movement area of an aerodrome the following shall apply:

- When two aircraft are approaching head on, or approximately so, **each shall stop or where practicable alter its course to the right** so as to keep well clear of each other
- When two aircraft are on a converging course, **the one which has the other on its right shall give way**
- An aircraft which is being overtaken by another aircraft shall have the right-of-way and the overtaking aircraft shall keep well clear of the other aircraft.

An aircraft taxiing on the manoeuvring area shall stop and hold at all runway-holding positions and all lighted stop bars unless otherwise authorized by the aerodrome control tower.

Note for IVAO, if the airfield is not controlled, the aircraft shall stop before all runways and send the required information on frequency of its intention to use the runway.

3.5. Lights to be displayed by aircraft

All aircraft in flight or on the movement area of an aerodrome fitted with anti-collision lights shall display these lights.

From sunset to sunrise or during any other period which may be prescribed by the appropriate authority all aircraft shall display:

- Anti-collision lights intended to attract attention to the aircraft **in flight**
- Navigation lights intended to indicate the relative path of the aircraft **in flight** to an observer and other lights shall not be displayed if they are likely to be mistaken for these lights.
- Navigation lights intended to indicate the relative path of the aircraft on the movement area of an aerodrome to an observer and other lights shall not be displayed if they are likely to be mistaken for these lights

Unless stationary or in an adequately illuminated area, all aircraft on the movement area of an aerodrome shall display lights intended to indicate the extremities of their structure.

All aircraft operating on the movement area of an aerodrome shall display lights intended to attract attention to the aircraft and all aircraft on the movement area of an aerodrome whose engines are running shall display lights which indicate that fact.

A pilot shall be permitted to switch off or reduce the intensity of any flashing lights if they do or are likely to adversely affect the satisfactory performance of duties or may subject an outside observer to harmful glare.

3.6. Flight plan

All information relative to an intended flight or portion of a flight, to be provided to air traffic services units, shall be in the form of a flight plan.

You must fill a flight plan for any flight performed, IFR or VFR, in the IVAO network.
This flight plan helps the network recognizes your connection; get your aircraft representation, your call sign, your departure and arrival airport, your flight rule.

Note that a VFR flight plan route is not mandatory (except in special cases).

All flight plans shall be submitted before departure.

A flight plan shall be submitted prior to operating:

- Any IFR flight
- Any flight along designated routes, when so required by the appropriate ATS authority to facilitate the provision of flight information, alerting and search and rescue services
- Any flight across international borders.

A flight plan shall include the following:

- Aircraft identification
- Flight rules and type of flight
- Number and type(s) of aircraft and wake turbulence category
- Equipment
- Departure aerodrome
- Estimated off-block time
- Cruising speed
- Cruising level
- Route to be followed
- Destination aerodrome and total estimated elapsed time
- Alternate aerodrome(s)
- Fuel endurance
- Total number of persons on board
- Emergency and survival equipment
- Other information

3.7. Time

Only Coordinated Universal Time (UTC) shall be used and shall be expressed in hours and minutes and, when required, seconds of the 24-hour day beginning at midnight.

A time check shall be obtained prior to operating a controlled flight and at such other times during the flight as may be necessary.

3.8. Air traffic control service

3.8.1. Air traffic control clearances

An air traffic control clearance shall be obtained prior to operating a controlled flight, or a portion of a flight as a controlled flight.

An aircraft operated on a controlled aerodrome shall not taxi on the manoeuvring area without clearance from the aerodrome control tower and shall comply with any instructions given by that unit.

Such clearance shall be requested through the submission of a flight plan to an air traffic control unit.

A controlled flight shall, except when landing at a controlled aerodrome, advise the appropriate ATC unit as soon as it ceases to be subject to air traffic control service.

3.8.2. Inadvertent changes

If your flight inadvertently deviates from its current flight plan, the following action shall be taken:

- **If the aircraft is off track**, action shall be taken forthwith to **adjust the heading of the aircraft to regain track as soon as practicable**.
- If the **average true airspeed** at cruising level between reporting points **varies or is expected to vary by ±5%** of the true airspeed (given in the flight plan), the appropriate air traffic services unit shall **be so informed**.
- If **the time estimate for the next applicable reporting point**, flight information region boundary or destination aerodrome, is found to be in error **in excess of 3 minutes** from that notified to air traffic services a revised estimated time **shall be notified as soon as possible to the appropriate air traffic services unit**.

3.8.3. Communication

An aircraft operated as a controlled flight shall maintain continuous voice communication and establish two-way communication with the appropriate air traffic control unit.

Note that in IVAO, the pilot must use text mode if voice communication is not possible.

3.9. Weather deterioration below the VMC during a VFR flight

When it becomes evident that flight in VMC conditions and in accordance with its current flight plan **will not be practicable**, a VFR flight operated as a controlled flight shall follow one of the following options:

- Request an amended clearance enabling the aircraft to continue in VMC conditions to its destination (other route) or to an alternative aerodrome, or to leave the airspace within which an ATC clearance is required
- If no clearance can be obtained, continue to operate in VMC conditions and notify the appropriate ATC unit of the action being taken either to leave the airspace concerned or to land at the nearest suitable aerodrome
- If operated within a control zone, request authorization to operate as a special VFR flight if the local regulation permits that.
- Request clearance to operate in accordance with instrument flight rules (IFR).

Altitude band	Airspace class	Minimum flight visibility	Minimum distance from clouds
At and above 3050m (10000ft) AMSL	A, B, C, D, E, F, G	8 km	1500 m horizontally 300m (1000ft) vertically
Below 3050m (10000ft) AMSL **And above**, 900m (3000ft) AMSL or 300m (1000ft) above terrain, whichever is the higher	A, B, C, D, E, F, G	5 km	1500 m horizontally 300m (1000ft) vertically
At or below 900m (3000ft) AMSL or 300m (1000ft) above terrain, whichever is the higher	A, B, C, D, E	5 km	1500 m horizontally 300m (1000ft) vertically
	F, G	5 km (*)	Clear of cloud and with the surface in sight

Remark (*):
Where flight visibility has been reduced to not less than 1500m, flights may be permitted at speeds that give adequate opportunity to observe other traffic or any obstacles in time to avoid collision.

1. When the height of the transition altitude is lower than 3050m (10000ft) AMSL, FL100 should be used.
2. Helicopters **may be permitted to operate in less than 1500m flight visibility** if they can observe other traffic and any obstacles in time to avoid collision. (Depends on your country regulation).
3. The VMC minima in class A airspace are included for guidance to pilots and **do not imply acceptance of VFR flights in class A** airspace automatically.

VFR WEATHER MINIMUM CONDITIONS

VFR minima are the minimum weather requirements in order to perform a VFR flight.

These minima are applicable in the following altitude and airspace classes.
The parameters to take into account are visibility and minimum distances from clouds.

Altitude band	Airspace class	Minimum flight visibility	Minimum distance from clouds
At and above 3050m (10000ft) AMSL	A, B, C, D, E, F, G	8 km	1500 m horizontally 300m (1000ft) vertically
Below 3050m (10000ft) AMSL **And above**, 900m (3000ft) AMSL or 300m (1000ft) above terrain, whichever is the higher	A, B, C, D, E, F, G	5 km	1500 m horizontally 300m (1000ft) vertically
At or below 900m (3000ft) AMSL or 300m (1000ft) above terrain, whichever is the higher	A, B, C, D, E	5 km	1500 m horizontally 300m (1000ft) vertically
	F, G	5 km (*)	Clear of cloud and with the surface in sight

Remark (*):
Where flight visibility has been reduced to not less than 1500m, flights may be permitted at speeds that give adequate opportunity to observe other traffic or any obstacles in time to avoid collision (dependant on the country regulations).

1. When the height of the transition altitude is lower than 3050m (10000ft) AMSL, FL100 should be used.
2. Helicopters **may be permitted to operate in less than 1500m flight visibility** if they can observe other traffic and any obstacles in time to avoid collision. (Depends on your country regulations).
3. The VMC minima in class A airspace are included for guidance to pilots and **do not imply acceptance of VFR flights in class A** airspace automatically.

METEOROLOGICAL AIRPORT REPORT

1. Introduction

1.1. METAR

A METAR (Meteorological Airport Report) is a meteorological observation report (not a prediction) dedicated to aviation.

This international code was developed by the ICAO and approved by the World Meteorological Organization. Baseline data are common to all countries, but some sections of the code are subject to local variations.

This kind of message is updated each hour (or less, depending on the airfield).

It allows knowing the meteorological conditions on an airfield at a given timeframe. Its elements are determinants in order to choose the landing/departing direction for example.

1.2. SPECI

A SPECI is identical to a METAR with the difference that it is not created regularly but from time to time.

It is a special observation message showing a punctual meteorological event that occurred since the last METAR or SPECI published.

1.3. Syntax and Structure

The METARs have a syntax that may appear a bit complex. The terms used in this code are abbreviations coming from different languages.

Example of a METAR:
LFPO 041300Z 36020KT 320V040 1200 R26/0400 +RASH BKN040TCU 17/15 Q1015 RETS 26791299

1.4. Unities

The unities are also variables and have been settled from the history development of aviation and the influence of USA and British pioneers in aerospace.

We use:

- The **feet (ft)** for the clouds height above ground
- The **knot (kt)** for the wind speed (kt=nautical mile per hour)
- The **meter (m)** for the horizontal visibility
- The **hectopascal (hPa)** for the atmospheric pressure (QNH QFE)
- The **degree Celsius (°C)** for the temperature measurement

Some unities can change depending of the countries.
For example, we use:

- The **meter per second 'mps' (m/s)** in Russia for the wind speed
- The **kilometer per hour 'km' (km/h)** in Russia for the indicated airspeed
- The **American land mile 'SM'** for the visibility in North America
- The **inch of mercury (inHg)** for the atmospheric pressure in America (1013hPa=29,92 inHg)

2. Decoding the METAR

Now, we will start decoding the following METAR:

LFPO 041300Z 36020KT 320V040 1200 R26/0400 +RASH BKN040TCU 17/15 Q1015 RETS 26791299

2.1. Airfield ICAO code

LFPO 041300Z 36020KT 320V040 1200 R26/0400 +RASH BKN040TCU 17/15 Q1015 RETS 26791299

This ICAO code is Paris-Orly airport / LFPO.

Nearly all airports in the world have a unique ICAO code; it is a location indicator **with 4 letters**.

- 1st letter determines an area in the world (France is in the **L** area)
- 2nd letter determines a country in the world area (**F** for France)
- 3rd and 4th letters determine an airfield

Just after the airfield ICAO code, you can find:

- **AUTO** indicates a fully automated report with no human intervention. It is removed when an observer logs on to the system.
- **NIL** is inserted if the **observation message is missing**. It is at the end of the message.

2.2. Date and time of the observation

LFPO **041300Z** 36020KT 320V040 1200 R26/0400 +RASH BKN040TCU 17/15 Q1015 RETS 2679199

This group means that the date and time of the weather observation is number **04** of the current month, at **13:00** hours UTC (Z or GMT)

This group is constructed with:

- Two digits which represent the day of the weather observation
- Four digit time followed by letter **Z** which represent the hours and minutes

Times are always in UTC using a 24-hour clock.

2.3. Surface wind and wind orientation

LFPO 041300Z **36020KT** 320V040 1200 R26/0400 +RASH BKN040TCU 17/15 Q1015 RETS 26791299

This group means that the wind comes from **360**° blowing at **20** knots (kt).

It is a **five digits group** which shows the **average wind during 10 minutes** followed (without any space) by an abbreviation of the wind speed unity (KT, MPS…).

- The first three digits indicate the **wind direction** in degrees.
- The last two, **the wind speed** juxtaposed with the speed unit.

The wind direction indicates that the wind comes in front of the aircraft when its heading equals the wind direction.
The wind direction is indicated in multiples of 10° true rounded to the multiple or at the nearest number.

The wind direction values below 100° are always preceded by a **0**.
A wind blowing from the true north is indicated by **360°** (and not 000°).

When during the last 10 minutes preceding the observation the maximum wind speed during gusts (average during 3 seconds) **exceeds the average wind speed by at least 10 knots or more, this maximal speed is indicated directly after the average speed** using **G** between the two values.

The wind direction is written **VRB (variable winds)** instead of the average direction when:

- The wind speed is below 3 knots (6 km/h) and the total variation, during 10 minutes, of the wind direction is above or equals to 60°.
- The wind speed is above or equals to 3 knots (6 km/h) and the total variation, during 10 minutes, of the wind direction is above or equals to 180°.

Examples:
00000KT = Wind calm when the average speed is below 1 knot
27010G25KT = wind 270° 10kt with gusts at 25kt (**G**=gust)
VRB03KT = wind from variable direction blowing at 3kt

2.4. Wind direction variation

LFPO 041300Z 36020KT **320V040** 1200 R26/0400 +RASH BKN040TCU 17/15 Q1015 RETS 26791299

This group means that the wind direction is variable around 360° BETWEEN **320**° and **040**°.

Note that it is an optional group; it is present only to indicate a variable wind.

When during the 10 minutes period preceding the observation, the wind direction variability is between 60° included and 180° excluded and the average speed is above or equals to 3 knots (6 km/h), both extreme directions observed are indicated in clockwise direction, and the '**V**' letter is inserted between the two values.

2.5. Visibility

LFPO 041300Z 36020KT **1200** R26/0400 +RASH BKN040TCU 17/15 Q1015 RETS 26791299

This group means that the minimal horizontal visibility is **1200 meters over the whole horizon**

The **visibility** is a measure of the opacity of the atmosphere. An automated, instrumentally derived visibility value is a sensor value converted to an appropriate visibility value using standard algorithms and is considered to be representative of the visibility in the vicinity of the airport runway complex. A manually derived visibility value is obtained using the "prevailing visibility" concept. In this section, the term "prevailing visibility" shall refer to both manual and instrument derived values.

The **4 figures are indicating the visibility in meters**. One or two letters can be added to define a particular visibility in a sector.

Note: In special cases, if local conditions vary greatly then two groups may be displayed showing the visibility variation in different sectors.

Automated stations shall use an **M** to indicate "less than" when reporting visibility. (Example: **M1SM**)

There are some specific visibility codes:
0000 = visibility is **below** 50 m
9999 = visibility is **greater** than 10 km (or equal)

Sometimes the visibility can contain an additional letter which indicates the direction of this visibility:
4000NE = visibility is 4000 m at north-east (mean visibility = 1.5x4000 = 6000 M)
1400S 4000N = visibility is 1400 m at south but 4000 m at north

The unit of visibility is meter by default, but in some countries we can use the American land mile:
10SM = visibility of 10 statute miles or American land mile (=1.625km)
1/4SM = visibility of 0.25 statute miles (one quarter)
1 1/2SM = visibility of 1 SM + ½ SM = 1.5 statute miles

In some METARs, the visibility information can be replaced by a group of letters:
CAVOK = **C**louds **A**nd **V**isibility **OK**
NSC = **N**o **S**ignificant **C**louds (no clouds below 5000 feet, no cumulonimbus (CB) or towering cumulus(TCU))
SKC = **SK**y **C**lear – no clouds

Three conditions in order to have a CAVOK:
1. No clouds exist below 5000 feet or below the highest minimum sector altitude, whichever is greater, and no cumulonimbus or towering cumulus are present.
2. Visibility is 10 kilometres or greater
3. No precipitation, thunderstorms, sandstorm, dust storm, shallow fog, or low drifting dust, sand or snow is occurring (no significant weather).

Note that the term **CAVOK** is not used in the United States

2.6. Runway visual range

LFPO 041300Z 36020KT 320V040 1200 **R26/0400** +RASH BKN040TCU 17/15 Q1015 RETS 26791299

This group means that the RVR or runway visibility range is **400** meters on runway **26**

Note that it is an optional group; it is present only to indicate the runway visual range when visibility is below 1500m.

Runway Visual Range is an indication of the real visibility as measured down the runway either electronically or manually. RVR will always be prefixed by the letter R followed by the runway for which the value has been taken

Some letters **M**, **P**, **D**, **U**, **B** and **V** can be added to the RVR to specify the evolution of visibility.

Examples:
R25/M0075 = RVR runway 25 is less than 75 meters (M=Minus)
R33L/P1500 = RVR runway 33 LEFT is greater than 1500 meters (P=Plus)
R16R/1000D = RVR runway 16 RIGHT is 1000 meters with aggravation (D=Down)
R16R/1000U = RVR runway 16 RIGHT is 1000 meters with improvement (U=UP)
R33C/0900N = RVR runway 33 CENTRE is 900 meters with no change (N=No change)
R27/0150V0300U = RVR runway 27 variable (V) from 150 to 300 meters with improvement (U= Up)

2.7. Weather phenomena

LFPO 041300Z 36020KT 320V040 1200 R26/0400 **+RASH** BKN040TCU 17/15 Q1015 RETS 26791299

This group is the present weather phenomena and means that at the airfield, we have heavy (**+**) Shower (**SH**) Rain (**RA**)

Note that it is an optional group; it is present only to indicate that precipitation and weather and obscuration phenomena are present.

A present weather phenomenon includes precipitations, obscurations and other weather phenomena. The present weather may be evaluated instrumentally, manually, or through a combination of instrumental and manual methods.

Weather phenomena: VC = in **Vi**C**i**nity MI = Shallow PR = **P**a**R**tial DR = low **DR**ifting BL = **BL**owing FZ = **F**ree**Z**ing RE = **RE**cent BC = Patches SH = **SH**ower TS = **T**hunder**S**torm XX = Violent	Precipitation: RA = **RA**in SN = **SN**ow GR = Hail DZ = **D**ri**Z**zle PL = ice **P**e**L**lets GS = **G**re**S**il SG = **S**now **G**rains IC = **I**ce **C**rystals UP = **U**nknown **P**recipitation
Obscuration: BR = Mist FG = **F**o**G** HZ = **H**a**Z**e FU = Smoke SA = **SA**nd DU = **DU**st VA = **V**olcanic **A**sh	Others : PO = Well developed dust / sand whirls SS = **S**and**S**torm DS = **D**ust**S**torm SQ = **SQ**ualls FC = **F**unnel **C**loud +FC = e.g. tornado
Intensity qualifier: **sign "-"** = Light **No sign** = Moderate **sign "+"** = Heavy	

2.7.1. Precipitation definition

Precipitation is any of the forms of water particles, whether liquid or solid, that falls from the atmosphere and reaches the ground. The types of precipitation are:

- **Drizzle**: Fairly uniform precipitation composed exclusively of fine drops with diameters of less than 0.02 inch (0.5 mm) very close together. Drizzle appears to float while following air currents, although unlike fog droplets, it falls to the ground.
- **Rain**: Precipitation, either in the form of drops larger than 0.02 inch (0.5 mm), or smaller drops which, in contrast to drizzle, are widely separated.
- **Snow**: Precipitation of snow crystals mostly branched in the form of six-pointed stars.
- **Snow Grains**: Precipitation of very small, white, and opaque grains of ice.
- **Ice Crystals** (Diamond Dust): A fall of unbranched (snow crystals are branched) ice crystals in the form of needles, columns, or plates.
- **Ice Pellets**: Precipitation of transparent or translucent pellets of ice, which are round or irregular, rarely conical, and which have a diameter of 0.2 inch (5 mm), or less. There are two main types: Hard grains of ice consisting of frozen raindrops, or largely melted and refrozen snowflakes. Pellets of snow encased in a thin layer of ice which have formed from the freezing, either of droplets intercepted by the pellets, or of water resulting from the partial melting of the pellets.
- **Hail**: Precipitation in the form of small balls or other pieces of ice falling separately or frozen together in irregular lumps.
- **Small Hail and/or Snow Pellets**: Precipitation of white, opaque grains of ice. The grains are round or sometimes conical. Diameters range from about 0.08 to 0.2 inch (2 to 5 mm).

2.7.2. Obscuration definition

An obscuration is any phenomenon in the atmosphere, other than precipitation, that reduces the horizontal visibility. These include:

- **Mist**: A visible aggregate of minute water particles suspended in the atmosphere that reduces visibility to less than 7 statute miles but greater than or equal to 5/8 statute miles.
- **Fog**: A visible aggregate of minute water particles (droplets) that is based at the earth's surface and reduces horizontal visibility to less than 5/8 statute miles and, unlike drizzle, it does not fall to the ground.
- **Smoke**: A suspension in the air of small particles produced by combustion. A transition to haze may occur when smoke particles have travelled great distances (25 to 100 miles or more) and when the larger particles have settled out and the remaining particles have become widely scattered through the atmosphere.
- **Volcanic Ash**: Fine particles of rock powder that originate from a volcano and that may remain suspended in the atmosphere for long periods.
- **Widespread Dust**: Fine particles of earth or other matter raised or suspended in the air by the wind that may have occurred at or far away from the station that may restrict horizontal visibility.
- **Sand**: Sand particles raised by the wind to a height sufficient to reduce visibility.
- **Haze**: A suspension in the air of extremely small, dry particles invisible to the naked eye and sufficiently numerous to give the air an opalescent appearance.
- **Spray**: An ensemble of water droplets torn by the wind from the surface of an extensive body of water, generally from the crests of waves, and carried up a short distance into the air.

2.7.3. Other weather phenomena

These other phenomena include:

- **Well-developed Dust/Sand Whirl**: An ensemble of particles of dust or sand, sometimes accompanied by small litter, rose from the ground in the form of a whirling column of varying height with a small diameter and an approximately vertical axis.
- **Squall**: A strong wind characterized by a sudden onset in which the wind speed increases at least 16 knots and is sustained at 22 knots or more for at least one minute.
    - **Funnel Cloud (Tornado Activity)**: These include:
    - **Tornado** = A violent, rotating column of air touching the ground.
    - **Funnel Cloud** = A violent, rotating column of air which does not touch the surface.
- **Waterspout** = A violent, rotating column of air that forms over a body of water, and touches the water surface.
- **Sandstorm**: Particles of sand carried aloft by a strong wind. The sand particles are mostly confined to the lowest ten feet, and rarely rise more than fifty feet above the ground.
- **Dust storm**: A severe weather condition characterized by strong winds and dust-filled air over an extensive area.

2.8. Cloud layers

LFPO 041300Z 36020KT 320V040 1200 R26/0400 +RASH **BKN040TCU** 17/15 Q1015 RETS 26791299

This group is the cloud layer group. The example means that we have a broken (**BKN**) clouds layer at 4000ft (**040**) with presence of tower cumulus (**TCU**)

2.8.1. Sky coverage

The sky coverage shall be coded for each layer reported by using the appropriate reportable contraction:

- **FEW** = *Few* = 1/8th to 2/8th of sky coverage
- **SCT** = *Scattered* = 3/8th to 4/8th of sky coverage
- **BKN** = *Broken* = 5/8th to 7/8th of sky coverage
- **OVC** = *Overcast* = 8/8th of sky coverage

Sky condition shall be coded in the format **XXXYYY** where **XXX** is the **cover code** (e.g. FEW or BKN) and **YYY** its **height above surface**:

- There shall be no space between the summation layer amount of sky cover and the height of the layer.
- Heights of sky cover shall be evaluated in feet above the surface.
- Heights of layers shall be reported in hundreds of feet, rounded to the nearest reportable increment.
- When a cloud layer is 50 feet or less above the surface, the height shall be reported as 000.
- Each layer shall be separated from other layers by a space.

If there is no significant layer, METAR can use this term:

- **NSC** = **N**o **S**ignificant **C**louds
- **NCD** = **N**o **C**loud **D**etected
- **SKC** = **S**ky **C**lear

Clear skies shall be coded in the format, **SKC** or **CLR**, where SKC is the abbreviation used by manual stations to indicate no layers are present and CLR is the abbreviation used by automated stations to indicate no layers are detected **at or below 12,000 feet**.

A METAR can include one or several layers, or no layer at all.

Example:
FEW015 SCT023 BKN041 describes 3 layers in the following order: FEW clouds layer at 1500ft AGL, SCT clouds layer at 2300ft AGL and BKN clouds layer at 4100ft AGL.

At manual stations, cumulonimbus (**CB**) or towering cumulus (**TCU**) shall be appended to the associated layer.

Examples:
BKN025TCU = BROKEN cloud layer at 2500ft with **towering cumulus**
SCT020CB = SCATTERED cloud layer at 2000ft with **cumulonimbus**

The ceiling (coverage > 50% or 4/8th) is the height above the earth's surface of the lowest layer that is reported as broken (BKN) or overcast (OVC); or if the sky is totally obscured, the vertical visibility shall be the ceiling.

Sky condition shall be coded in an ascending order up to the first overcast layer. At mountain stations, if the layer is below station level, the height of the layer shall be coded as ***///***.

2.8.2. Vertical visibility

Vertical visibility shall be coded in the format **VVxxx** where:

- **VV** is the abbreviation for **V**ertical **V**isibility
- **xxx** the visibility's value in hundreds of feet.

If there is no information available the report shall contain **VV*///***. There shall be no space between the **VV** identifier and the value.

Example:
VV010 reports a vertical visibility of 1000ft.

2.9. Air temperature and dew point

LFPO 041300Z 36020KT 1200 R26/0400 +RASH BKN040TCU **17/15** Q1015 RETS 26791299

This group is the air temperature and dew point group. The example means the air ***temperature*** is **17 degrees Celsius** and its ***dew point*** at **15 degrees Celsius**.

This group gives the temperature value followed by the dew point temperature. They are in degrees Celsius.
The temperature shall be separated from the dew point by a solidus "**/**".

The temperature and dew point shall be coded as two digits rounded to the nearest whole degree Celsius. Sub-zero temperatures and dew points shall be prefixed with an **M**.

Examples:
00/M00 = Air temperature is +0°C, dew point temperature is -0°C
(Example if air temperature is +0.3°C and dew point is -0.2°C)
M03/M05 = Air temperature is -3°C, dew point temperature is -5°C

If the temperature is not available, the entire temperature/dew point group shall not be coded. If the dew point is not available, the temperature shall be coded followed by a solidus "**/**" and no entry made for dew point.

2.9.1. Temperature

The temperature is the **degree of hotness or coldness of the ambient air** as indicated as measured by any suitable instrument.

2.9.2. Dew point

The dew point is the **temperature where the water vapor in a volume of humid air at a constant barometric pressure will condense into liquid wate**r. The dew point is a water-to-air saturation temperature.

The **dew point is associated with relative humidity**. A high relative humidity indicates that the dew point is closer to the current air temperature. Relative humidity of 100% indicates the dew point is equal to the current temperature and that the air is maximally saturated with water. When the dew point remains constant and temperature increases, relative humidity decreases

2.10. Pressure at mean sea level

LFPO 041300Z 36020KT 320V040 1200 R26/0400 +RASH BKN040TCU 17/15 **Q1015** RETS 26791299

This group is the pressure at mean sea level group. The example means that the sea level pressure or QNH at the aerodrome is **1015** hectopascal.

2.10.1. Mean sea level pressure (QNH):

The mean sea level pressure or QNH is a pressure value obtained by the theoretical reduction of barometric pressure to sea level.

Where the earth's surface is above sea level, it is assumed that the atmosphere extends to sea level below the station and that the properties of that hypothetical atmosphere are related to conditions observed at the station.

The group starts with a **Q** letter followed by its 4 digit value given in hecto Pascal.
The decimal values are not given.

In some countries (North American), the mean sea level pressure is not given in hecto Pascal but in inches of mercury (inHg).

In this case, the altimeter group always starts with an A letter. The altimeter setting shall be coded as a four digit group immediately following the **A** using the tens, units, tenths, and hundredths of inches of mercury.
The decimal point is not coded.

2.10.2. Station Pressure: (QFE)

The station pressure or QFR is the atmospheric pressure at the designated station elevation.

Examples:
QFE 987 = pressure at surface or QFE is 987 hecto pascal

Coding the sea-level pressure group:
The sea-level pressure group is included in the remarks section of the message. It starts with 'SLP' and is followed by 3 digits (units, tenths and hundreds).
A sea-level pressure of 1002.5 hecto pascal is **SLP025**.

2.11. Recent weather

LFPO 041300Z 36020KT 320V040 1200 R26/0400 +RASH BKN040TCU 17/15 Q1015 **RETS** 26791299

This group is the recent weather group. The example means Recent (**RE**) Thunderstorm (**TS**)

Note that it is an optional group; it is present only to indicate when recent weather phenomena are present.

The recent weather takes some of the codes presented in the previous weather phenomena chapter. This group gives some important recent information that is not included in the METAR.

Examples:
RERA = REcent RAin
WS TKOF RWY 26 = WindShear during take-off on runway 26 reported
WS LDG RWY28L = WindShear during LANDING on runway 28 LEFT reported
SNOCLO = Airfield closed due to snow

2.12. Runway status

LFPO 041300Z 36020KT 1200 R26/0400 +RASH BKN040TCU 17/15 Q1015 RETS **26791299**

Runway **26**: ice (**7**) covering more than 51% of the runway (**9**), coverage height of 12 millimeters (**12**), braking coefficient incapable of measurement or not reliable (**99**)

This table includes the optional data of a runway condition indication in a METAR and declares how its syntax works:

Runway designator	Type of coverage	Dimension of coverage	Height of coverage	Friction coefficient and braking action
15: RWY15 or 15L **65:** 15R (15+50) **88 :** ALL RWYs	**0:** dry and clear **1:** humid **2:** wet or puddles **3:** collar **4:** dry snow **5:** wet snow **6:** snow slush **7:** ice **8:** compressed snow **9:** frozen wheel tracks **/:** type not specified or unavailable	**1:** up to 10% **2:** 11 - 25% **5:** 26 - 50% **9:** 51 - 100% **/:** not specified	**00:** < 1 mm **01:** 1 mm **02:** 2 mm **03:** 3 mm ... **10:** 1 cm (10 mm) ... **50:** 5 cm **90:** 9 cm **92:** 10 cm **93:** 15 cm **94:** 20 cm ... **97:** 35 cm **98:** >= 40 cm **99:** RWY not useable **//:** No measurement	Frictional coefficient **R** and braking action **B**: **R** < 26 - **B** bad **R** 26-29 - **B** bad/moderate **R** 30-35 - **B** moderate **R** 36-39 - **B** moderate/good **R** > 39 - **B** good **91: B** bad **92: B** bad/moderate **93: B** moderate **94: B** moderate/good **95: B** good **99: B** and **R** not specified or not reliable **//:** RWY not in use

Note: It is an optional group. This group is present only to indicate special runway conditions.

2.13. Prevision

The Prevision group can be found in the METAR.
Hereunder you will find some definitions and examples.

Examples:
NOSIG = **NO SIG**nificant changes coming within the next two hours
BECMG = weather development (**BEC**o**M**in**G**)
TEMPO = **TEMPO**rary existing weather phenomena (changes to the main report)
FM = **F**ro**M** (time)
AT = time
TL = un**T**i**L** (time)

2.13.1. Becoming group

BECMG is the indicator of regular or irregular evolution of weather conditions. It is only used when the evolution begins and ends at the hours of the beginning and the end of the tendency or occurs at the uncertain one o'clock during the validity of the tendency.

BECMG AT1200 33010KT = wind becomes 330° at 10 knots at 12h00 UTC
BECMG FM1130 TL1230 0350 = visibility will be 350m from 11h30 until 12h30 UTC

2.13.2. Temporary group

TEMPO is the indicator of temporary weather fluctuations of one or several parameters for less than one hour and covering less than half of the period. It is only used when the beginning and the end of the period of temporary fluctuations correspond at the beginning and at the end of the validity of the tendency.

TEMPO FM1130 TL1230 OVC006 = temporary fluctuation between 11h30 and 12h30 UTC, with overcast cloud layer at 600ft
TEMPO 3000 SHRA = temporary visibility 3000m with rain showers

3. AIRMETs

Hazardous weather advisories of **moderate** intensity will be issued as AIRMETs. AIRMETs are issued when the following conditions are expected to cover an area of at least 3000 square miles:

- Moderate icing.
- Moderate turbulence.
- Sustained surface winds of 30 knots or more.
- Ceilings less than 1,000 ft. and/or visibility less than 3 miles affecting 50% of an area at one time.
- Extensive mountain obscuration.

4. SIGMETs

Hazardous weather advisories of **severe** intensity will be issued as SIGMETs. SIGMETs are reported as convective or no convective:

- Convective SIGMETs report only thunderstorms and related phenomena (tornadoes, heavy precipitation, hail and high surface winds).
- No convective SIGMETs are issued when the following conditions occur or are expected to cover an area of at least 3,000 square miles:
    - Severe or extreme turbulence or clear air turbulence (CAT) not associated with thunderstorms.
    - Severe icing not associated with thunderstorms.
    - Widespread dust storms, sandstorms, or volcanic ash lowering surface or in-flight visibilities to below three miles.

4.1. Volcanic eruption

Volcanic eruption SIGMET's are identified by an alphanumeric designator which consists of an alphabetic identifier and issuance number.
The first time an advisory is issued for a phenomenon associated with a particular weather system, it will be given the next alphabetic designator in the series and will be numbered as the first for that designator. Subsequent advisories will retain the same alphabetic designator until the phenomenon ends.

In the conterminous U.S., this means that a phenomenon that is assigned an alphabetic designator in one area will retain that designator as it moves within the area or into one or more other areas. Issuance's for the same phenomenon will be sequentially numbered, using the same alphabetic designator until the phenomenon no longer exists. Alphabetic designators NOVEMBER through YANKEE, except SIERRA and TANGO are only used for SIGMET's, while designators SIERRA, TANGO and ZULU are used for AIRMET's

4.2. Pilot weather report

Pilots will report any significant weather or flight condition to you as ATC as soon as possible. Additionally, you can expect that all significant weather or flight conditions that clearly differ from the forecast will be reported by the pilot. There is no specific format for this type of report.

Remember: If there is any wind shear during departure or approach the pilot will inform the tower controller.

INTERNATIONAL ALPHABET

1. Introduction

International Alphabet is the common name for the **alphabet spelling convention** defined by the International Civil Aviation Organization (ICAO).

ICAO has assigned a word to each of the alphabet letters in order to understand each letter well and avoid confusion using them in radio communication.

These words have been chosen to be understandable by any person in the world and non-dependent from one language.

This type of letter coding has been created during the second world war by the American army (with an initial spelling which has disappeared now).

These codes are mainly used in **voice radio communication.**

There is few application of using this alphabet in text mode: for example the ATIS information letter, some VFR points …

Look at the next page to find the whole table.

2. Table

The table below presents the letter code used in the international alphabet with its English pronunciation. We add also in this table, the Morse code in order to help you decode the radio navigation beacons.

Character	Morse Code	Letter Code	Pronunciation
A	• –	Alfa	AL-FAH
B	– • • •	Bravo	BRA-VOH
C	– • – •	Charlie	CHAR-LEE
D	– • •	Delta	DELL-TAH
E	•	Echo	ECK-OH
F	• • – •	Foxtrot	FOKS-TROT
G	– – •	Golf	GOLF
H	• • • •	Hotel	HOH-TELL
I	• •	India	IN-DEE-AH
J	• – – –	Juliet	JEW-LEE-ETT
K	– • –	Kilo	KI-LOH
L	• – • •	Lima	LEE-MAH
M	– –	Mike	MIKE
N	– •	November	NO-VEM-BER
O	– – –	Oscar	OSS-CAH
P	• – – •	Papa	PAH-PAH
Q	– – • –	Quebec	KEH-BECK
R	• – •	Romeo	ROW-ME-OH
S	• • •	Sierra	SEE-AIR-RAH
T	–	Tango	TANG-GO
U	• • –	Uniform	YOU-NE-FORM
V	• • • –	Victor	VIK-TAH
W	• – –	Whiskey	WISS-KEY
X	– • • –	X-ray	ECKS-RAY
Y	– • – –	Yankee	YANG-KEY
Z	– – • •	Zulu	ZOO-LOO

AIR TRAFFIC CONTROLLER STATION CALL SIGN

Service Provided	Radio Callsign	IVAO position	Remarks
Area Control Center	**Control**	**_CTR**	**Default appellation**
Area Control Center	**Center**	_CTR	Only in USA
Area Control Center	**Radar**	_CTR	This position appellation is sometimes used in some countries.
Approach Control Arrival and Departure	**Approach**	**_APP**	**Default appellation** (Used when no _DEP position is open).
Approach Control Arrival Only	**Arrival**	_APP	Used when DEP position is open
Precision Approach Control	**Precision**	_APP	Only for some specific military approach
Approach Control Departure Only	**Departure**	**_DEP**	**Default appellation** (used only with APP and TWR positions open)
Aerodrome Control	**Tower**	_TWR	**Default appellation** Position can handle ground operation and delivery clearance if there is no specific ATC for these tasks.
Surface Movement Control	**Ground**	_GND	**Default appellation**
Apron Control	**Apron**	_GND	Apron control is included in Surface Movement Control in IVAO (GND position)
Clearance Delivery	**Delivery**	_DEL	**Default appellation**
Clearance Delivery	**Pre-flight**	_DEL	This position appellation is sometimes used in some countries.
Flight Service Station	**Information**	_FSS	**Default appellation** Used mainly in USA and Canada
Flight Information Service	**Flight service**	/	This position appellation is use in New Zealand.
Flight Information Service	**Information**	/	In IVAO, this information service is given by TWR, APP or CTR position. No specific position for this service
Direction Finding Station	**Homer**	/	This position is not available in IVAO

AIRCRAFT CALL SIGN FORMAT

1. Introduction

As an aircraft has the possibility to use radio communication as a transmitting station on the air, it must have a unique designation named call sign.

This call sign must be normally used during air band radio transmissions.

A call sign shall be one of the following types:

- The characters corresponding to the **registration marking of the aircraft.**
- **The telephony designator of the aircraft operating company or agency**, followed by the last four characters of the registration marking of the aircraft.
- **The telephony designator of the aircraft operating company or agency**, followed by the flight identification.

The aircraft operating company or agency type is the most widely used within commercial aviation. The flight identification is usually the flight number or flight identification.

2. Radio usability

On initial contact, a pilot must spell his complete call sign, usually at the end of his message. Always pronounce each digit separately.

After good communication has been established, the abbreviated call sign may be used when initiated by ATC

2.1. Aircraft Abbreviated Callsign Rules

After satisfactory communication has been established, and provided that no confusion is likely to occur, aircraft call signs may be abbreviated as follows:

- **the first** and **at least the last two characters** of the aircraft registration;
- **the telephony designator of the aircraft** operating agency followed by **at least the last two characters** of the aircraft registration;
- No abbreviated form.

A pilot shall use his abbreviated call sign only after the air traffic controller has taken the initiative.

Air traffic controllers can use abbreviated call signs only after satisfactory communication has been established and no confusion with other aircraft on your frequency is possible.

Any aircraft in the heavy wake turbulence category shall include the word "**HEAVY**" immediately after the aircraft call sign in the initial contact between such aircraft and ATS units.
The word "**SUPER**" shall be used for an Airbus 380 aircraft.

2.2. Example of abbreviated call signs

Aircraft call signs may be abbreviated with the first and at least the last two characters of the aircraft registration.

OOFWA	OSCAR _ _ WHISKEY ALFA
N202PY	NOVEMBER _ _ _ PAPA YANKEE NOVEMBER _ _ TWO PAPA YANKEE

Either the name of the aircraft manufacturer or the aircraft model may be used instead of the first character.

OOFWA	Robin _ _ _ WHISKEY ALPHA Robin _ _ FOXTROT WHISKEY ALPHA
OOTMG	Piper _ _ _ MIKE GOLF Piper _ _ TANGO MIKE GOLF

The telephony designator of the aircraft operating agency or company call sign followed by at least the last two characters of the registration.

Speedbird (BAW2595) Registered as GBOAC	SPEEDBIRD _ _ _ ALPHA CHARLIE SPEEDBIRD _ _ OSCAR ALPHA CHARLIE

2.3. Call sign confusion

Air traffic controllers must pay attention to call sign confusion when two or more flights with similar flight numbers fly close to each other.

Example: KLM685 and KLM689 / BAW556 and BAW665 / AFR 324 and AFR 342

Air traffic controllers must pay attention that they do not use duplicate abbreviated call signs when 2 or more aircraft share the same. In that case, you must use the complete call sign.

Example: DEHLB and DAHLB share the same abbreviated call sign D_LB

When there is any risk of confusion, the full call sign shall be used all the time.

3. Aircraft registration call sign (country based)

All aircraft have a unique registration call sign based on the home country.

The aircraft registration call sign is a group of characters and it is constructed with:

- a prefix : **the** nationality or common mark
- a **suffix :** registration mark

Spell the call sign on frequency using the NATO Alphabet only.

Call sign	Prefix	Call sign spelling	Country
OOTWA	OO	OSCAR OSCAR TANGO WISKEY ALFA	Belgium
DEDJF	D	DELTA ECHO DELTA JULLIET FOXTROT	Germany
FCYAB	F	FOXTROT CHARLIE YANKEE ALFA BRAVO	France
N04252	N	NOVEMBER ZERO FOUR TWO FIVE TWO	USA

4. ICAO airline designator

The ICAO airline designator is a code assigned by the International Civil Aviation Organization (ICAO) to aircraft operating agencies, aeronautical authorities, and services related to international aviation.

ICAO formatted call signs start with the 3 letter ICAO code of the airline (prefix) followed by a telephony designator. Each aircraft have a unique call sign with ICAO designator.

Call sign	ICAO Code	Prefix spelling	Full call sign spelling
VIP 418	VIP	Freewings	Freewings FOUR ONE EIGHT
SVA 011	SVA	Saudi	Saudi ZERO ONE ONE
BCS 666	BCS	Eurotrans	Eurotrans SIX SIX SIX
DLH 1EE	DLH	Lufthansa	Lufthansa ONE ECHO ECHO
BAW 4212	BAW	Speedbird	Speedbird FOUR TWO ONE TWO

Be careful that the prefix spelling can be very different from the real company name. Example: BAW = Speedbird (prefix spelling) = British Airways (company)

5. IATA airline designators

IATA airline designators are two-character codes assigned by the International Air Transport Association (IATA) to the world's airlines.

Airline designator codes follow the 2 alphanumeric characters (letters or digits). It can be followed by an optional letter.

These IATA airline designators are used in real aviation for company flight tickets and at check-in desks.

Examples: **SN**2268 **TV**884 **KL**1722 **AF**301

In real life IATA abbreviations are NOT used by ATC, pilots and in flight plans.
Only ICAO call signs are used.

Do not mix IATA designator and reduced ICAO prefix from 3 characters to 2 characters.
In real aviation, some airlines use reduced ICAO prefix for their flights.

RADIOTELEPHONY BASICS

1. General operating procedures

Radiotelephony (RTF) provides the means by which pilots and ground personnel communicate with each other. The information and instructions transmitted are of vital importance in the safe and expeditious operation of aircraft.

Incidents and accidents have occurred in which a contributing factor has been the use of non-standard procedures and phraseology.
The importance of using correct and precise standardized phraseology cannot be overemphasized.

2. Transmitting techniques

The following transmitting techniques will assist in ensuring that transmitted speech is clear:

- Listen out on the frequency some seconds before transmitting to ensure that there will be no interference with a transmission from another station
- Press the transmit switch fully before speaking and do not release it until the message is completed. This will ensure that the entire message is transmitted
- Use a normal conversational tone, and speak clearly and distinctly and maintain the speaking volume at a constant level
- Make a slight pause before and after numbers will assist in making them easier to understand
- Avoid using hesitation sounds such as "er"
- Suspend speech temporarily if it becomes necessary to turn the head away from the microphone

When switching to a new frequency, using TeamSpeak, the active transmission can be not heard all the time. So, it is important to listen first before transmitting.

3. Transmission of letters

With the exception of the telephony designator and the type of aircraft, each letter in the aircraft call sign shall be spoken separately using the phonetic spelling.

Character	Morse Code	Letter Code	Pronunciation
A	• –	Alfa	AL-FAH
B	– • • •	Bravo	BRA-VOH
C	– • – •	Charlie	CHAR-LEE
D	– • •	Delta	DELL-TAH
E	•	Echo	ECK-OH
F	• • – •	Foxtrot	FOKS-TROT
G	– – •	Golf	GOLF
H	• • • •	Hotel	HOH-TELL
I	• •	India	IN-DEE-AH
J	• – – –	Juliet	JEW-LEE-ETT
K	– • –	Kilo	KI-LOH
L	• – • •	Lima	LEE-MAH
M	– –	Mike	MIKE
N	– •	November	NO-VEM-BER
O	– – –	Oscar	OSS-CAH
P	• – – •	Papa	PAH-PAH
Q	– – • –	Quebec	KEH-BECK
R	• – •	Romeo	ROW-ME-OH
S	• • •	Sierra	SEE-AIR-RAH
T	–	Tango	TANG-GO
U	• • –	Uniform	YOU-NE-FORM
V	• • • –	Victor	VIK-TAH
W	• – –	Whiskey	WISS-KEY
X	– • • –	Xray	ECKS-RAY
Y	– • – –	Yankee	YANG-KEY
Z	– – • •	Zulu	ZOO-LOO

To expedite communications, the use of phonetic spelling should be dispensed with if there is no risk of this affecting correct reception and intelligibility of the message.

4. Transmission of numbers

The numbers shall be transmitted using the following pronunciation:

numeral element	Pronunciation
0	ZE-RO
1	WUN
2	TOO
3	TREE
4	FOW-er
5	FIFE
6	SIX
7	SEV-en
8	AIT
9	NIN-er
'.' or decimal	DAY-SEE-MAL
100 or hundred	HUN-dred
1000 or thousand	TOU-sand

The syllables printed in capital letters are to be stressed.

4.1. Transmission by pronouncing each digit separately

The numbers in the table below shall be transmitted by pronouncing each digit separately:

Aircraft call signs	Transmitted as
CCA 238	Air china **two three eight**
OAL 242	Olympic **two four two**

Flight level	Transmitted as
FL 180	Flight level **one eight zero**
FL 200	Flight level **two zero zero**

Heading	Transmitted as
100°	heading **one zero zero**
080°	heading **zero eight zero**

Wind direction / speed	Transmitted as
200° 25kt	Wind **two zero zero** degrees **two five** knots
160° 18kt	Wind **one six zero** degrees **one eight** knots

Transponder codes	Transmitted as
2400	Squawk **two four zero zero**

Runway	Transmitted as
27	Runway **two seven**
30	Runway **three zero**

Altimeter	Transmitted as
1010	One zero one zero
1000	On zero zero zero
999	Nine nine nine

4.2. Transmission by pronouncing digit

All numbers used in the transmission of altitude, cloud height, visibility and runway visual range (RVR) information, which contain whole hundreds and whole thousands, shall be transmitted by pronouncing each digit in the number of hundreds or thousands followed by the word HUNDRED or THOUSAND as appropriate.

altitude	Transmitted as
800 ft	eight hundred
3400 ft	three thousand four hundred
12000 ft	one two thousand

cloud height	Transmitted as
1000 ft	visibility one thousand
700 ft	visibility seven hundred

runway visual range	Transmitted as
600 m	RVR six hundred
1700 m	RVR one thousand seven hundred

4.3. Transmission of frequency

All six digits of the numerical designator should be used to identify the transmitting channel in VHF radiotelephony communications, except in the case of both the fifth and sixth digits being zeros, in which case only the first four digits should be used:

Channel	Transmitted as
118.000	ONE ONE EIGHT DECIMAL ZERO
118.005	ONE ONE EIGHT DECIMAL ZERO ZERO FIVE
118.010	ONE ONE EIGHT DECIMAL ZERO ONE ZERO
118.025	ONE ONE EIGHT DECIMAL ZERO TWO FIVE
118.050	ONE ONE EIGHT DECIMAL ZERO FIVE ZERO
118.100	ONE ONE EIGHT DECIMAL ONE

4.4. Transmission of time

Only the minutes of the hour should normally be required to transmit time. Each digit should be pronounced separately.
However, the hour should be included when any possibility of confusion is possible.

Time	Transmitted as
0920 (09:20am)	TWO ZERO ZERO NINE TWO ZERO
1643 (4:43pm)	FOUR THREE ONE SIX FOUR THREE

5. Radiotelephony standard words

The following words and phrases shall be used in radiotelephony communications as appropriate and shall have the meaning given below.

Words	Meaning
ACKNOWLEDGE	*Let me know that you have received and understood this message*
AFFIRM	*Yes*
APPROVED	*Permission for proposed action granted*
BREAK	*I hereby indicate the separation between portions of the message.*
BREAK BREAK	*I hereby indicate the separation between messages transmitted to different aircraft in a very busy environment*
CANCEL	*Annul the previously transmitted clearance*
CHECK	*Examine a system or procedure*
CLEARED	*Authorized to proceed under the conditions specified*
CONFIRM	*I request verification of: (clearance, instruction, action, information)*
CONTACT	*Establish communications with ...*
CORRECT	*'True" or "Accurate"*
CORRECTION	*An error has been made in this transmission (or message indicated). The correct version is …*
DISREGARD	*Ignore*
HOW DO YOU READ	*What is the readability of my transmission?*
I SAY AGAIN	*I repeat for clarity or emphasis*
MAINTAIN	*Continue in accordance with the condition given or last*
MONITOR	*Listen out on (frequency).*
NEGATIVE	*No or Permission not granted or That is not correct or not capable*
OVER	*My transmission is ended and I expect a response from you. (military use)*
READ BACK	*Repeat all, or the specified part, of this message back to me exactly as received.*
RECLEARED	*A change has been made to your last clearance and this new clearance supersedes your previous clearance or part thereof.*
REPORT	*Pass me the following information ...*
REQUEST	*I should like to know ... / I wish to obtain ...*
ROGER	*I have received all of your last transmission.*
SAY AGAIN	*Repeat all, or the following part, of your last transmission*
SPEAK SLOWER	*Reduce your rate of speech.*
STANDBY	*Wait and I will call you."*

UNABLE	*I cannot comply with your request, instruction, or clearance*
WILCO	*I understand your message and will comply with it*
WORDS TWICE	*Communication is difficult. Please send every word or group of words twice.*

6. Establishing communication

Controllers should pass a clearance slowly and clearly since the pilot needs to write it down and wasteful repetition will thus be avoided.

6.1. Issue of clearance

Whenever possible, a route clearance should be passed to an aircraft before start up.
Controllers should avoid passing a clearance to a pilot engaged in complicated taxiing maneuvers and on no occasion should a clearance be passed when the pilot is engaged in line up or take-off manoeuvres.

An air traffic control (ATC) route clearance is not an instruction to take off or enter an active runway.

The words "TAKE OFF" are used only when an aircraft is cleared for take-off, or when cancelling a take-off clearance. At other times, the word "DEPARTURE" or "AIRBORNE" is used.

6.2. First contact

When establishing communications, an aircraft should use the full call sign of both the aircraft and the aeronautical station and an ATC shall start his message with the pilot call sign.

Pilot	ATC
Highvilla tower, **DEHBA**	
	DEHBA, Highvilla tower, hello.

The pilot must pass his call sign at the end of the message all the time, because the air traffic controller may be handling many aircraft at the same time. The pilots identify themselves using their call signs.

An ATC shall begin his message with the concerned pilot call sign to be sure that the right pilot carefully listens in the clearances given. An ATC is not required to say his call sign. He can do it at the first contact or when the pilots misspell his call sign.

6.3. Read back requirements

Read-back requirements have been introduced in the interest of flight safety.

The stringency of the read-back requirement is directly related to the possible seriousness of a misunderstanding in the transmission and receipt of ATC clearances and instructions.

Strict adherence to read-back procedures ensures not only that the clearance has been received correctly but also that the clearance was transmitted as intended.
It serves as a check that the right aircraft, and only that aircraft, will take action on the clearance.

The following shall always be read back:

- ATC route clearances
- clearances and instructions to enter, land on, take off from, hold short of, cross and backtrack on any runway
- runway-in-use, altimeter settings, SSR codes, level instructions, heading and speed instructions
- transition level

An aircraft should terminate the read-back by its call sign.

Examples of read back:

Pilot	ATC
	DEHBA, taxi holding point runway 01
taxi holding point runway 01, DEHBA	

Pilot	ATC
	DEHBA, squawk 4525
4525, DEHBA	

If an aircraft read-back of a clearance or instruction is incorrect, the controller shall transmit the word "NEGATIVE I SAY AGAIN" followed by the correct version:

Pilot	ATC
	DEHBA, QNH 1003
QNH 1033, DEHBA	
	DEHBA, Negative I say again, QNH 1003
QNH 1003, DEHBA	

6.4. Test procedure

When a communication with an air traffic controller seems to be difficult, a pilot can use a radio communication test procedure:

Test transmissions should take the following form as a pilot:

1. the identification of the aeronautical station being called;
2. your aircraft identification;
3. the words "RADIO CHECK"
4. the frequency being used.

Replies to test transmissions should be as follows:

1. the identification of the station calling;
2. the identification of the station replying;
3. Level of reception regarding the readability of the transmission.

Readability of the transmission	Level of reception
Unreadable.	**1**
Readable now and then.	**2**
Readable but with difficulty.	**3**
Readable.	**4**
Perfectly readable.	**5**

Example:
ROMA TOWER, I-ABCD, RADIO CHECK, 118.5
I-ABCD, ROMA TOWER, READING YOU **3**

Q CODE

1. Introduction

The Q code is a standardized collection of three-letter message encodings initially developed for commercial radiotelegraph communication, and later adopted by other radio services.

They start with the letter "Q".

Although Q codes were created when radio used Morse code exclusively, they continued to be employed after the introduction of voice transmissions.

2. Q code in aeronautics

2.1. Altimeter settings

Q code	Definition
QFE	Atmospheric pressure at a specified datum such as airfield runway threshold.
QNH	Atmospheric pressure at mean sea level (may be either a local, measured pressure or a regional forecast pressure (RPS)).

2.2. Radio navigation

Q code	Definition
QDM	Magnetic bearing to a station (ex: VOR)
QDL	Series of bearings taken at regular intervals
QDR	Magnetic bearing from a station
QFU	Magnetic bearing of the runway in use
QGE	Distance
QGH	Controlled descent through clouds
QTE	True bearing from a station
QTF	Position in relation to a point of reference or in latitude and longitude
QUJ	True bearing to a station

DEFINITIONS

ABEAM — The general position of an aircraft in relation to a fix, point or object that is approximately 90 degrees to the right or left of the aircraft's track.

ABORT — To terminate a planned aircraft manoeuvre.

ACCIDENT — Any aviation occurrence where, at any time during the period commencing when the first person boards an aircraft for the purpose of flight and ending when the last person disembarks from the aircraft after the flight:

A. a person, other than a stowaway, sustains a serious injury or fatal injury that is not self-inflicted or inflicted by another person or caused by natural causes, as a result of that person:

1. being in the aircraft;
2. coming into direct contact with any part of the aircraft, including any part that may have become detached from the aircraft; or
3. being directly exposed to the jet blast of the aircraft;

B. the aircraft sustains damage or structural failure adversely affecting the structural strength, performance or flight characteristics of the aircraft and normally requiring major repair or replacement of any affected component part, other than damage or failure that is limited to:

1. the engine, its cowlings, or its accessories;
2. the propellers, wing tips, antennas, tires, brakes or fairings; or
3. small dents or puncture holes in the aircraft skin; or

C. the aircraft is missing or is completely inaccessible.

ACTIVE RUNWAY — Any runway currently being used for take-off or landing. When multiple runways are being used, they are all considered active runways.

AERODROME — Any area of land, water (including the frozen surface thereof) or other supporting surface used, designed, prepared, equipped or set apart for use, either in whole or in part, for the arrival, departure, movement or servicing of aircraft. This includes any buildings, installations and equipment situated thereon or associated therewith.

AERONAUTICAL GROUND LIGHT — any light specially provided as an aid to air navigation, other than a light displayed on an aircraft.

AIR TAXI — Movement of a helicopter above the surface of an aerodrome, but normally not above 100 feet AGL. The aircraft may proceed via either hover taxi or flight at speeds more than 20 knots. The pilot is solely responsible for selecting a safe airspeed/altitude for the operation being conducted. (See HOVER TAXI).

AIR TRAFFIC — All aircraft in flight and aircraft operating on the manoeuvring area of an aerodrome.

AIR TRAFFIC CONTROL CLEARANCE — Authorization issued by an ATC unit for an aircraft to proceed within controlled airspace in accordance with the conditions specified by that unit.

AIR TRAFFIC CONTROL INSTRUCTION — A directive issued by an ATC unit for air traffic control purposes.

AIR TRAFFIC CONTROL UNIT — As the circumstances require, this may be:

A. an Area Control Centre, established to provide air traffic control service to IFR aircraft and CVFR aircraft;

B. a Terminal Control Unit, established to provide air traffic control service to IFR and CVFR aircraft arriving at, or departing from, one or more airports; or

C. an Airport Control Tower Unit, established to provide air traffic control service to airport traffic.

AIR TRAFFIC CONTROLLER — A person holding a valid licence to control air traffic.

AIR TRAFFIC SERVICES — The following services that are provided by ATC units:

A. IFR CONTROL SERVICES

1. AREA CONTROL SERVICE — The control service provided by ACCs to IFR and CVFR aircraft operating within specified control areas.

2. TERMINAL CONTROL SERVICE —

The control service provided by ACCs and TCUs to aircraft operating within specified control areas.

B. VFR CONTROL SERVICES

1. AIRPORT CONTROL SERVICE — The control service provided by Airport Control Towers to airport traffic.

2. RADAR SERVICE — The control service provided by ATC units to:

a. VFR aircraft operating within Class B, C and D airspace; and

b. aircraft in a Tower Radar Area.

C. INFORMATION SERVICES

1. AIRCRAFT MOVEMENT INFORMATION SERVICE (AMIS) — The service provided by ACCs for the collection, processing, and dissemination of aircraft movement information, for use by air defence units.

2. ALERTING SERVICE — The service provided by ATC units to notify appropriate organizations regarding aircraft in need of search and rescue aid, and to assist such organizations, as required. This service also includes the alerting of crash equipment, ambulances, doctors, and any other safety services.

3. FLIGHT INFORMATION SERVICE — The service provided by ATC units for the purpose of giving advice and information, useful for the safe and efficient movement of aircraft. This service includes:

a. information on adverse weather conditions as reported, visually observed, or radar observed;

b. information on the unserviceability of NAVAIDs and facilities;

c. traffic information;

d. radar assistance, on request, to all aircraft operating within radar coverage and desiring position information, navigational guidance, or both; and

e. VHF/UHF direction-finding assistance to aircraft operating within the range of stations so equipped.

D. SUPPLEMENTARY SERVICES

1. ALTITUDE RESERVATION SERVICE — The service provided by ARE, ARW and ACCs to provide reserved altitudes for specified air operations in controlled airspace and to provide information concerning these reservations and military activity areas in controlled and uncontrolled airspace.

AIRBORNE COLLISION AVOIDANCE SYSTEM — An aircraft system, based on secondary surveillance radar (SSR) transponder signals, which operates independently of ground-based equipment, to provide advice to the pilot on potential conflicting aircraft that are equipped with SSR transponders.

AIRCRAFT MOVEMENT — A take-off, landing, or simulated approach by an aircraft.

AIRCRAFT MOVEMENT SURFACE CONDITION REPORT — The report that details the surface conditions for all aircraft movement areas including runway, taxiways and aprons.

AIRCRAFT OCCURRENCE — Any deviation from the IVAO Regulations associated with the operation of an aircraft.

AIRFILE — A term used to indicate that a flight plan or flight itinerary information was filed by an aircraft in flight.

AIRMET — Short-term meteorological information intended primarily for aircraft in flight, to notify pilots of potentially hazardous weather conditions not described in the current area forecast and not requiring a SIGMET. The criteria for issuing an AIRMET are the unforeseen development, dissipation or non-occurrence of forecast

A. IFR conditions (broken or overcast cloud condition at less than 1000 ft. AGL and/or visibility less than 3 SM);
B. freezing precipitation (not requiring a SIGMET);
C. moderate icing;
D. moderate turbulence;
E. thunderstorms (isolated as opposed to a line);
F. an increase in the surface mean wind over a large area to 20 kt. or more, or an increase in gusts to 30 kt. or more, when no winds were originally forecast; or
G. a difference between the forecast and observed wind direction greater than 60°.

AIRPORT — An aerodrome in respect of which an airport certificate is in force.

AIRPORT CONTROLLER — Duty controller assigned to the airport control position in an Airport Control Tower.

AIRPORT TRAFFIC — All traffic on the manoeuvring area of an airport and all aircraft flying in the vicinity of an airport.

ALTIMETER SETTING REGION — Designated areas within which aircraft shall use the altimeter setting of the nearest station along the route of flight.

ALTITUDE —
A. The vertical distance of a level, a point or an object considered as a point, measured from mean sea level.
B. Altitude indicated on an altimeter set to the current altimeter setting.

ALTITUDE READOUT — The Mode C-derived altitude information displayed in a digital target tag, a Hold List or a Suspend List.

ALTITUDE READOUT VALUE — The altitude figures currently displayed in an altitude readout.

ALTITUDE RESERVATION — An airspace of defined dimensions within controlled airspace, reserved for the use of a civil or military agency during a specified period. An altitude reservation may be confined to a fixed area (stationary) or moving in relation to the aircraft that operate within it (moving).

ALTITUDE RESERVATION SPECIALIST — An employee in ARE or ARW assigned responsibility for processing requests for altitude reservations.

AMIS SECTION — A section established within an ACC to provide Aircraft Movement Information Service to air defence units.

APPROACH AREA — (see Final Approach Area).

APPROACH LIGHTS — Lights indicating a desired line of approach to a landing area.

APRON — That part of an aerodrome, other than the manoeuvring area, intended to accommodate the loading and unloading of passengers and cargo, the refuelling, servicing, maintenance, and parking of aircraft, and any movement of aircraft, vehicles, and pedestrians necessary for such purposes.

ARC — The track over the ground, of an aircraft flying at a constant distance from a NAVAID, by reference to distance measuring equipment (DME).

AREA CONTROLLER — Duty controller assigned to a control position in an ACC.

AREA NAVIGATION — A method of navigation that permits aircraft operations on any desired track within the coverage of station-referenced navigation signals, or within the limits of a selfcontained navigation system.

AREA OF RESPONSIBILITY — A geographical area within which alerting service is provided by a unit designated as the responsible unit.

ARRIVAL CONTROLLER — Duty controller assigned to an arrival control position.

AUTOMATIC TERMINAL INFORMATION SERVICE (ATIS) — The provision of current, routine information to arriving and departing aircraft, by means of continuous and repetitive recorded broadcasts throughout the day or a specified portion of the day.

BACKTRACK — The taxiing of an aircraft on an active runway, in a direction opposite to the landing or take-off direction.

BASE LEG — A flight path extending from the end of the downwind leg to the extended centreline of the approach end of the landing runway (or landing path).

BEACON — An aeronautical light arranged, either through optical design or mechanical motion, to be visible to all azimuths, either continuously or consecutively, to designate a particular point on the surface of the earth.

CAUTIONARY (WAKE TURBULENCE) —
Information to an aircraft on one of the following:

A. The possible location of wake turbulence.
B. The location of a heavy or medium aircraft behind which it will pass or follow.

CAVOK — An abbreviation indicating the simultaneous occurrence of the following meteorological conditions:

A. no cloud below 5,000 feet, or below the highest minimum sector altitude, whichever is higher, and no cumulonimbus;
B. a visibility of 6 statute miles/10 kilometres or more; and
C. no precipitation, thunderstorms, shallow fog, or low drifting snow.

CEILING — The lowest height at which a broken or overcast condition exists, or the vertical visibility when an obscured condition such as snow, smoke or fog exists, whichever is the lower.

CLEARANCE LIMIT — The point to which an aircraft is granted an ATC clearance.

CLEARED FOR THE OPTION —
For an arriving aircraft — ATC authorization for an aircraft to make a touch-and-go, low approach, missed approach, stop and go, or full stop landing at the discretion of the pilot.
For a departing aircraft — ATC authorization for an aircraft to make a simulated rejected take-off, reduced power take-off and a simulated engine out failure on departure procedure at the discretion of the pilot.

CLOSED RNAV STAR — A STAR that terminates at the Final Approach Course Fix (FACF). Normally used when the inbound track is within plus or minus 90 degrees, of the final approach course, to the runway.

COASTING — A function that displays the predicted position of a target for a flight plan correlated radar tracks in the event of a missed or ambiguous radar return. (IVAC v1.x does not include this feature)

CODE (SSR Code) — The number assigned to a particular multiple-pulse reply signal transmitted by a transponder.

COMMON POINT —

A. A single fix, whether a ground based NAVAID, a fix derived from NAVAIDs, or geographical coordinates expressed in degrees of latitude and longitude, over which two or more aircraft will pass, or have passed before proceeding on the same track or diverging tracks.

B. For the purpose of longitudinal separation between aircraft using DME and/or GPS, a common point is defined as the same DME NAVAID, the same GPS reference position or a collocated DME NAVAID/GPS reference position.

COMPANY INSTRUMENT APPROACH PROCEDURE — An approach procedure, approved by local authority, for use by an operator, or number of operators, that is not published in the Aeronautical Information Publication.

COMPANY ROUTE — A route exclusive of an airway or air route, for the specific use of an operator or number of operators.

COMPULSORY REPORTING POINT — A reporting point over which an aircraft must report to ATC.

CONFLICT — Actual or predicted convergence of aircraft which violates one or more separation minima.

CONFLICT RESOLUTION — The resolution of potential conflicts between IFR/VFR and VFR/ VFR aircraft that are radar identified and in communication with ATC.

CONTACT APPROACH — An approach wherein an aircraft on an IFR flight plan, having an air traffic control authorization, operating clear of clouds with at least 1 mile or 1500 metres flight visibility and a reasonable expectation of continuing to the destination airport in those conditions, may deviate from the instrument approach procedure and proceed to the destination airport by visual reference to the surface of the earth.

CONTROLLED AIRPORT — An airport at which an airport control service is provided.

CONTROLLED AIRSPACE — An airspace of defined dimensions within which air traffic control service is provided.

CONTROLLED VFR FLIGHT — A flight conducted under the visual flight rules within Class B Airspace and in accordance with an air traffic control clearance.

CONTROLLER JURISDICTION SYMBOL (CJS) — One or two alphanumeric characters that identify a sector.

COORDINATING CONTROLLER — A duty controller assigned to coordinate flight data between two or more control positions.

CORRELATION — A function that matches a radar track with flight plan data on the basis of an aircraft's discrete SSR code or a manual input. (Show FlightPlan in IVAC v1.x)

CORRELATION LINE — A line, with reference to which aircraft movement information is required.

CROSSWIND — For runway operations a crosswind is considered to exist whenever the surface wind exceeds an angle of 19 to 90 degrees to the runway in use, thus subtracting from the ground speed of an aircraft using that particular runway.

CROSSWIND COMPONENT — The wind speed measured in knots at angles from 20 to 90 degrees from the runway in use which would equal the effect of a wind applied at 090 degrees to the runway in use. Components are specified in a component table for a specified permissible crosswind.

CROSSING TRACK — A term used in the application of separation, indicating tracks that converge or diverge at an angle of 45 degrees to 135 degrees inclusive.

DEPARTURE CONTROLLER — Duty controller assigned to a departure control position.

DISCRETE EMERGENCY FREQUENCY — A frequency used by AFF at specified airports for direct ground communications with cockpit crews during an incident.

DISTANCE MEASURING EQUIPMENT (DME) — Equipment, airborne and ground, used to measure, in nautical miles, the slant range distance from a DME NAVAID.

DME FIX — A geographical position determined by reference to a NAVAID, which provides distance and azimuth information and is defined by a specified distance in nautical miles and a radial in degrees magnetic or true from the NAVAID.

DOWNWIND LEG — A flight path parallel to the landing runway (or landing path) in the direction opposite to landing.

DOWNWIND TERMINATION WAYPOINT (DTW) — The waypoint located downwind to the landing runway abeam the FACF where an open RNAV STAR terminates.

EMERGENCY COORDINATION CENTRE (ECC) — An agency, established at selected airports, to provide assistance to aircraft experiencing emergencies such as bomb threats or hijacking.

ESTABLISHED HOLDING AREA — A holding area which has been predetermined by the unit responsible for the airspace concerned.

ESTIMATE — The time, in UTC, at which an IFR aircraft is calculated, by either the controller or pilot, to arrive over a significant point.

ESTIMATED — The terminology used within Air Traffic Services when communicating an ATC estimate.

ESTIMATED TIME OF ARRIVAL — The time at which it is estimated that the aircraft will land, provided no delay is experienced. Calculation of the estimated time of arrival in the case of an IFR flight, to an aerodrome served by one or more navigation aids, is based on the average time required by the aircraft to complete an instrument approach procedure at the aerodrome.

ESTIMATING — The terminology used within Air Traffic Services when communicating a pilot estimate.

EXPANDED FRONTAL WIDTH — Either the lateral distance between the outermost aircraft in a moving altitude reservation, when such distance has been stated in an APREQ and has been approved, or the approved frontal width for a non-standard formation flight.

EXPECT APPROACH CLEARANCE TIME — The time at which it is expected that an aircraft will be cleared to commence approach for a landing.

EXPECT FURTHER CLEARANCE TIME — The time at which it is expected that further clearance will be issued to an aircraft.

FACT FINDING BOARD — A team convened following an operating irregularity involving air traffic controllers, to investigate the occurrence.

FINAL APPROACH — The segment of an instrument approach between the final approach fix or point and the runway, airport or missed approach point, whichever is encountered last, wherein alignment and descent for landing are accomplished.

FINAL APPROACH COURSE — The microwave landing system (MLS), localizer, global positioning system (GPS) or area navigation (RNAV) course, LF/MF bearing or VHF/UHF radial that defines the final approach track specified in an instrument approach procedure (IAP) or, in the case of a radar approach, the extended runway centreline.

FINAL APPROACH COURSE FIX — A fix or waypoint aligned on the final approach course of an instrument procedure:

A. prior to the point of glide path intercept on a precision approach;

B. prior to the final approach fix on a nonprecision approach procedure that has a designated final approach fix;

C. prior to any step-down fixes on a nonprecision approach with designated fixes but no final approach fix; and

D. on a non-precision approach procedure with no final approach fix or step-down fixes at a point that would permit a normal landing approach.

FINAL APPROACH FIX — The fix of a nonprecision instrument approach procedure (IAP) where the final approach segment commences.

FINAL APPROACH LEG OR FINAL LEG — A flight path extending from the end of the base leg in the direction of landing, to and along the extended centreline of the runway (or landing path), to the threshold of the landing runway (or landing path).

FINAL APPROACH SEGMENT — That part of an instrument approach procedure (IAP) from the time that the aircraft:

A. completes the last procedure turn or base turn, where one is specified;

B. crosses the final approach fix (FAF), waypoint or point; or

C. intercepts the last track specified for the procedure until it reaches the missed approach point (MAP). It is in this part of the procedure that alignment and descent for landing are accomplished.

FIX — A geographical location determined either by visual reference to the ground, or by means of radio aids or other navigational devices.

FIX TOLERANCE AREA — An area determined by considering the position indication errors applicable to a particular type of fix.

FLIGHT INFORMATION REGION (FIR) — An airspace of defined dimensions, extending upwards from the surface of the earth, within which flight information service and alerting service are provided.

FLIGHT LEVEL — An altitude expressed in hundreds of feet, indicated on an altimeter set to 29.92 inches of mercury or 1013.2 millibars.

FLIGHT LINE — The actual photographic run of a photo survey aircraft, where a series of overlapping photographic exposures are being taken and where the aircraft must necessarily move precisely along a predetermined track(s) and at a predetermined critical altitude.

FLIGHT MANAGEMENT SYSTEM (FMS) - A computer system that uses a large database to allow routes to be programmed and fed into the system by means of a data loader. The system is constantly updated with respect to position and accuracy by reference to conventional navigational aids.

FLIGHT PLAN — Specified information submitted in accordance with the ICAO Regulations relative to the intended flight of an aircraft.

FLIGHT PLAN OFFICE — An office at which flight plans are to be filed. This may be an ATC unit, Flight Service Station, operations office, or other designated airport office.

FLIGHT VISIBILITY — The average range of visibility at any given time, forward from the cockpit of an aircraft in flight.

FLY-BY WAYPOINT - A waypoint that requires the use of turn anticipation to avoid overshoot of the next flight segment.

FLY-OVER WAYPOINT - A waypoint that precludes any turn until the waypoint is overflown by an intercept manoeuvre of the next flight segment.

FORMATION FLIGHT — More than one aircraft which, by prior arrangement between the pilots, normally operate as a single aircraft with regard to navigation and position reporting. Formation flights may be identified on individual IFR flight plans or may be contained within an ALTRV. As circumstances require, they may be:

A. Standard formation — One in which:

1. the formation leader will operate at the assigned altitude and the other formation aircraft will be within one hundred feet vertically of the altitude of the formation leader;
2. the formation will occupy a maximum frontal width of one NM; and
3. the formation will have a maximum longitudinal spacing of one NM between the first and the last aircraft.

B. Non-standard formation — An individual flight plan formation, whereby through prior arrangement with ATC, the flight leader has requested and ATC has approved other than standard formation dimensions.

FREE AREA — An area of defined dimensions, within which the flight of an aircraft, under certain conditions, does not normally require AMIS action.

FUEL REMAINING — A phrase used by both pilots and ATS when referring to the amount of fuel remaining on board until actual fuel exhaustion. When transmitting such information, either in response to an ATS query or a pilot initiated advisory, pilots will state the approximate number of minutes the flight can continue with the fuel remaining. All reserve fuel should be included in the time stated, as should an allowance for established fuel gauge system error.

FUNCTION — A single task performed by the system, either automatically or in response to a manual input.

GO AROUND — An instruction to abandon an approach or landing.

GROUND CONTROLLER — Duty controller assigned to the ground control position in an Airport Control Tower.

GROUND VISIBILITY — The visibility at an airport, as reported by an observer accredited by the local authorities for that purpose or the prevailing visibility as observed by an airport controller.

HAND-OFF — The process of transferring radar identification of an aircraft target and radio communications for that aircraft, to another controller, to enable uninterrupted provision of radar service.

HAZARDOUS SITUATION — An occurrence in which flight safety was jeopardized, or was not assured for a period of time.

HEADING — The direction in which the longitudinal axis of an aircraft is pointed, usually expressed in degrees from North (true, magnetic, compass, or grid).

HEAVY AIRCRAFT — An aircraft certificated for a maximum take-off weight of 136,000 kilograms (300,000 pounds) or more.

HOLDING AREA — The airspace to be protected for holding aircraft, in accordance with the ATC Holding Criteria Document.

HOLDING FIX — A fix that is specified as a reference point in establishing and maintaining the position of a holding aircraft.

HOVER TAXI — Movement of a helicopter above the surface of an aerodrome and in ground effect at airspeeds less than approximately 20 knots. The actual height may vary, and some helicopters may require hover taxi above 25 feet AGL, to reduce ground effect turbulence or provide clearance for cargo slingloads. (See AIR TAXI).

IFR AIRCRAFT — An aircraft operating in accordance with the instrument flight rules.

IFR FLIGHT — A flight conducted in accordance with the instrument flight rules.

INITIAL APPROACH FIX (IAF) — A fix at which an aircraft leaves the en route phase of operations in order to commence the approach.

INITIAL APPROACH SEGMENT — That segment of an instrument approach between the initial approach fix or waypoint and the intermediate fix or waypoint, wherein the aircraft departs the en route phase of flight and manoeuvres to enter the intermediate segment.

INSTRUMENT APPROACH PROCEDURE — A series of predetermined manoeuvres for the orderly transfer of an aircraft under instrument flight conditions, from the beginning of the initial approach to a landing or to a point from which a landing may be made visually.

INSTRUMENT FLIGHT RULES (IFR) — Set of rules governing the conduct of flight under instrument meteorological conditions.

INSTRUMENT METEOROLOGICAL CONDITIONS — Meteorological conditions less than the minima specified for visual meteorological conditions (VMC), expressed in terms of visibility and distance from cloud.

INSTRUMENT RUNWAY — Runway intended for the operation of aircraft making a precision or non-precision instrument approach.

INTERMEDIATE APPROACH SEGMENT — That segment of an instrument approach between the intermediate fix or point and the final approach fix or point, wherein aircraft configuration, speed and positioning adjustments are made in preparation for the final approach.

INTERMEDIATE FIX (IF) — The fix at which the aircraft enters the intermediate approach segment of an instrument approach.

INTERROGATOR — A ground-based SSR transmitter.

INTERRUPTIBLE POWER SUPPLY — A power system, with an automatic feature, that is subjected to a short power outage (5-20 seconds) when a break occurs in the normal power supply.

INTERSECTION — As the circumstances require, this may be:
A. the point defined by a combination of courses, radials, arcs or bearings of two or more navigational aids; or
B. the point where two runways, a runway and a taxiway, or two taxiways cross or meet.

ITINERANT AIRCRAFT — For the purpose of completing air traffic records, itinerant aircraft are considered as:
A. aircraft proceeding to or arriving from another location; or
B. aircraft that leave the circuit, but will be returning to land.

KNOWN AIRCRAFT — Aircraft of whose movements ATS has been informed.

LAHSO (Land and Hold Short Operations) — Operations which include simultaneous take-offs and landings and/or simultaneous landings when a landing aircraft is able and is instructed by the controller to hold-short of the intersecting runway/taxiway or designated hold-short point.

LANDING — In relation to an aircraft, means the act of coming into contact with a supporting surface and includes the immediately preceding and following acts and, in relation to an airship or free balloon, means the act of bringing the airship or balloon under restraint and includes the immediately preceding and following acts.

LATERAL — A secondary track, described in the DAH, established to facilitate the movement of aircraft from one primary track to another within a system of organized tracks.

LATERAL SEPARATION — Separation between aircraft at the same altitude expressed in terms of distance or angular displacement between tracks.

LIGHT AIRCRAFT — An aircraft certificated for a maximum take-off weight of 5,700 kilogram (12,500 pounds) or less.

LOCAL AIRCRAFT — For the purpose of completing air traffic records, local aircraft are considered as aircraft which remain in the circuit.

LONGITUDINAL SEPARATION — Separation between aircraft at the same altitude, expressed in units of time or distance along track.

LOSS OF SEPARATION — An occurrence in which less than the authorized minimum existed, or in which the minimum was not assured.

LOW APPROACH — An approach over an airport or runway following an instrument or VFR approach, including the go-around manoeuvre, where the pilot intentionally does not make contact with the runway.

MACH-NUMBER TECHNIQUE — The assignment by ATC of Mach-number values to aircraft that are in level flight, climbing or descending, in order to ensure that longitudinal separation is maintained.

MANOEUVRING AREA — That part of an aerodrome intended to be used for the take-off and landing of aircraft, and for the movement of aircraft associated with take-off and landing, excluding aprons.

MARKERS — Objects of a conventional shape, flags, or painted signs used to indicate specific areas and obstructions.

MARSA — A term used, whereby the military command/pilots involved, assume responsibility for separation of participating aircraft in a formation flight, or indicating that a military agency originating an ALTRV APREQ will assume responsibility for the separation of:
A. all aircraft operating within the same ALTRV;or

B. all aircraft operating within ALTRVs that are separated by less than the minima.

MEAN WIND — In OIDS, wind direction and speed as determined from a sample reading every second over the last two minutes. The display value is updated every 5 seconds.

MEDEVAC — A term used to request Air Traffic Service priority handling for a medical evacuation flight, based on a medical emergency in the transport of patients, organ donors, organs or other urgently needed lifesaving medical material. The term is to be used on flight plans and if a pilot determines that a priority is required in radiotelephony communications.

MEDIUM AIRCRAFT — An aircraft certificated for a maximum take-off weight of more than 5,700 kilograms (12,500 pounds), but less than 136,000 kilograms (300,000 pounds).

MINIMUM FUEL — An aircraft declaration that its fuel supply has reached a state where, upon reaching the destination, it can accept little or no delay. This is not an emergency situation but merely indicates an emergency situation is possible should any undue delay occur.

MINIMUM IFR ALTITUDE — The lowest IFR altitude established for use in a specific airspace. Depending on the airspace concerned, the minimum IFR altitude may be a

MOCA, MEA, AMA, minimum sector altitude, minimum vectoring altitude, safe altitude 100 nautical miles, transition altitude or missed approach altitude. The minimum IFR altitude provides obstruction clearance, but may or may not be within controlled airspace.

MINIMUM VECTORING ALTITUDE — The lowest altitude for vectoring aircraft by air traffic control that meets obstruction clearance and radio coverage requirements in the airspace specified.

MISSED APPROACH POINT (MAP) — That point on the final approach track which signifies the termination of the final approach and the commencement of the missed approach. It may be:

A. the intersection of an electronic glide path with a Decision Height;

B. a navigational facility located on the aerodrome;

C. a suitable fix (eg. DME);

D. specified distance past the NAVAID or final approach fix, not to exceed the distance from that NAVAID or fix to the nearest boundary of the aerodrome.

MISSED APPROACH PROCEDURE — The procedure to be followed if, after an instrument approach, a landing is not effected. This action may be either:

A. PUBLISHED MISSED APPROACH PROCEDURES — Instructions published on the approach plate or approved company approach plate; or

B. ALTERNATE MISSED APPROACH INSTRUCTIONS — ATC-originated instructions which take precedence over published missed approach procedures.

MISSED APPROACH SEGMENT — That part of an instrument approach procedure (IAP) between the missed approach point (MAP), the missed approach waypoint (MAWP), or the point of arrival at decision height (DH), and the specified missed approach NAVAID, intersection, fix or waypoint, as appropriate, at the minimum IFR altitude. It is in this part of the approach procedure that the aircraft climbs and returns to the en route structure or is positioned for holding or a subsequent approach. The route of flight and altitudes are depicted on instrument approach charts.

MISSING AIRCRAFT NOTICE (MANOT) — A message issued by an RCC to Flight Service Stations and ATC units, giving details of a missing aircraft.

MODE (SSR Mode) — Letter or number assigned to a specific pulse spacing of the interrogation signals transmitted by an interrogator.

MOVEMENT AREA — That part of an aerodrome intended to be used for the surface movement of aircraft and includes the manoeuvring area and aprons.

NAVAID — Any visual or electronic device, airborne or on the surface of the earth, that provides point-to-point guidance information or position data to aircraft in flight.

NAVIGATION CHANGEOVER POINT — The geographical point, between two specified NAVAIDs or between a geographical location and a NAVAID, at which a change is made from one navigation reference to another.

NIGHT — Period beginning one half-hour after sunset and ending one half-hour before sunrise and, in respect of any place where the sun does not rise or set daily, the period during which the centre of the sun's disc is more than six degrees below the horizon.

NO TRANSGRESSION ZONE — A corridor of airspace of defined dimensions, located centrally between the two extended runway centrelines, where controller intervention is required to manoeuvre the non-blundering aircraft, when the airspace is penetrated by an aircraft conducting a simultaneous approach to the adjacent parallel or near-parallel instrument runway.

NON-RADAR ROUTE — A route on which an aircraft is able to determine its position, track, and, consequently, the minimum IFR altitude, without the benefit of radar information.

NORMAL OPERATING ZONE — Airspace of defined dimensions, extending to either side of an ILS localizer centreline. Only the inner half of the normal operating zone is taken into account in independent approaches.

NOTAM — A notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.

NOW WIND — In OIDS, wind direction and speed as determined from a sample reading every second and averaged over the last five seconds. The display value is updated every second.

OMNI FACILITY — A VOR, TVOR, VORTAC, or TACAN, which provides azimuth information through 360 degrees, expressed as radials in degrees from the NAVAID.

OPEN RNAV STAR — A STAR that terminates at a Downwind Termination Waypoint (DTW). Normally used for aircraft approaching the airport via the downwind leg to the DTW.

OPERATING IRREGULARITY — A situation which occurs when air traffic services are being provided and when a preliminary investigation indicates that safety may have been jeopardized, less than minimum separation may have existed, or both.

OPERATING POSITION — A position within a sector from which air traffic services are provided. There may be one or more operating positions within a sector.

OVERLAY APPROACH — GPS Overlays are selected NDB, VOR or VOR/DME non-precision approaches that can be flown by GPS equipped aircraft, suffix “G”.

PAR CONTROLLER — Duty controller assigned to a precision radar approach control position.

PIREP — A pilot weather report pertaining to current weather conditions encountered in flight.

POINT OF ACTIVATION — A position, expressed in either 4-letter, 4-digit geographical reference (GEOREF) or 4-digit latitude and longitude, from which an aircraft departs or is estimated to be along its intended track.

POINT-OUT — An action taken by a controller to coordinate the radar identification of an aircraft target with another controller, when radio communication will not be transferred.

PRECISION RADAR APPROACH — An instrument approach in which the final approach is conducted in accordance with directions issued by a controller, referring to a precision approach radar display.

PROCEDURE — A recommended or optional directive or a mode of operation.

PROCEDURE TURN — A manoeuvre in which a turn is made away from a designated track followed by a turn in the opposite direction, both turns being executed so as to permit the aircraft to intercept and proceed along the reciprocal of the designated track. Procedure turns are designated “left” or “right” according to the direction of the initial turn. However, if possible, the procedure turn is designated “left.”

RADAR — A radio detection device which provides information on range, azimuth and/or elevation of objects.

A. PRIMARY RADAR — A radar system which uses reflected radio signals.

B. SECONDARY RADAR — A radar system wherein a radio signal transmitted from a radar station initiates the transmission of a radio signal from another station.

RADAR APPROACH — Approach executed by an aircraft under the direction of a radar controller.

RADAR CONTROLLED AIRSPACE — Controlled airspace within which radar control service is provided.

RADAR IDENTIFICATION — The process of ascertaining that a particular target is the radar return from a specific aircraft.

RADAR SERVICE — The term used to indicate a service provided directly by means of radar.

A. RADAR ADVISORY — The provision of advice and information based on radar observations.

B. RADAR CONTROL SERVICE — The control of aircraft through the provision of radar vectors in order to establish required separation and/or desired spacing between aircraft and between aircraft and obstructions.

C. RADAR MONITORING — The use of radar for the purpose of providing aircraft with information and advice relative to significant deviations from their normal flight path.

D. RADAR NAVIGATIONAL ASSISTANCE — The provision of position information, vectors, or track and ground speed checks.

E. RADAR SEPARATION — Radar spacing of aircraft in accordance with established minima, with information derived from radar sources.

RADIAL — A bearing from an OMNI facility, usually designated in degrees magnetic.

RECIPROCAL TRACK — A term used in the application of separation, indicating tracks that converge or diverge at an angle of 136 degrees to 180 degrees inclusive.

REDUCED VERTICAL SEPARATION MINIMUM — The application of 1,000 feet vertical separation at and above FL290 between RVSM certified aircraft operating in designated airspace.

REPORTING POINT — A specific fix in relation to which the position of an aircraft can be reported.

RESPONSIBLE UNIT — The unit assigned an area of responsibility in the VFR flight planning and alerting service.

RNAV APPROACH — A published IFR approach coded and included in an aircraft's navigation database and published in graphic and textual form to be used by aircraft appropriately equipped to conduct this approach.

RNAV SID — A published IFR standard instrument departure procedure coded and included in an aircraft's navigational database, published in graphic and textual form to be used by aircraft appropriately equipped and authorized to conduct this procedure.

RNAV STAR — A published IFR air traffic control arrival procedure coded and included in an aircraft's navigational database, published in graphic and textual form to be used by aircraft appropriately equipped and authorized to conduct this procedure.

ROLLING TAKE-OFF — One in which an aircraft taxies onto the runway and departs in one continuous motion.

ROTATION POINT — The location, along a runway, where an aircraft is brought to the flying attitude as take-off speed is reached.

RULE — A mandatory directive or a condition relating to the application of a separation minimum.

RUNWAY HEADING — The magnetic or true, as applicable, direction that corresponds with the runway centreline; not the painted runway number.

RUNWAY LIGHTS — Lights that are arranged along a runway to indicate the area available for landing and taking off.

SAFETY ALERT — Notification by an air traffic controller to an aircraft that it is at an altitude which, in the controller's judgment, places it in unsafe proximity to terrain, obstructions or other aircraft.

SAME TRACK — A term used in the application of separation, indicating identical tracks or tracks that converge or diverge at an angle of 1 degree to 44 degrees inclusive.

SECTOR — A part of an air traffic control unit that has a designated area of responsibility, in which air traffic services are provided.

SEPARATION — Spacing between aircraft, altitudes, or tracks.

SEPARATION MINIMUM — A statement of the least allowable amount of lateral, longitudinal, or vertical separation to be applied.

SIGMET — A weather advisory issued concerning weather significant to the safety of aircraft. SIGMET advisories include:

A. active thunderstorm areas or lines of thunderstorms;
B. hurricanes, tropical storms;
C. moderate hail;
D. severe turbulence;
E. severe icing;
F. marked mountain waves;
G. widespread sand or dust storms;
H. volcanic ash;
I. severe squall lines;

J. low-level wind shear; and
K. tornadoes or waterspouts.

SIGNIFICANT POINT — The term used to describe a NAVAID, a fix derived from a **NAVAID**, or a geographical location expressed in latitude and longitude.

SIMULATED APPROACH — An instrument approach, conducted in VFR weather conditions by an aircraft not on an IFR clearance.

SPECIAL AVIATION EVENT — An air show, a low level air race, an aerobatic competition, a fly-in or a balloon festival.

SPECIAL VFR FLIGHT (SVFR) — Visual flight authorized by an ATC unit to operate within a control zone under meteorological conditions that are below VFR weather conditions.

STACK — Aircraft holding at a common fix with vertical separation.

STANDARD INSTRUMENT DEPARTURE (SID) — An IFR air traffic control departure procedure, published in the Aeronautical Publication for pilot and controller use. SIDs may be either:
A. Pilot Navigation (Pilot Nav.) SIDs — SIDs where the pilot is required to use the applicable SID chart as reference for navigation to the en route phase; or
B. Vector SIDs — SIDs established where ATC will provide radar navigational guidance to a filed or assigned route, or to a fix depicted on the applicable SID chart. Pilots are expected to use the SID chart as reference for navigation, until radar vectoring is commenced.

STANDARD PRESSURE REGION — The area outside the altimeter setting region.

STANDARD TERMINAL ARRIVAL (STAR) — An IFR air traffic control arrival procedure published in the Aeronautical Publication for pilot and controller use. STATE AIRCRAFT — For the purposes of RVSM operations, state aircraft are those aircraft used in military, customs and police services.

STATION — One or more transmitters or receivers, or a combination of transmitters and receivers, including the accessory equipment, necessary at one location for carrying on a radio communication service.

STOP-AND-GO — A procedure in which an aircraft lands, makes a complete stop on the runway, and then commences a take-off from that point.

STRAIGHT-IN APPROACH (IFR) — An instrument approach in which final approach is begun without first having executed a procedure turn.

STRAIGHT-IN APPROACH (VFR) — An approach in which the traffic circuit is entered on the final leg, without having executed any other part of the circuit.

SURVEILLANCE APPROACH — An emergency radar approach intended to assist an aircraft in executing an approach and landing.

TAKE-OFF — In relation to an aircraft, means the act of abandoning a supporting surface and includes the immediately preceding and following acts and, in relation to an airship or balloon, means the act of freeing the airship or balloon from restraint and includes the immediately preceding and following acts.

TAILWIND — For runway operations a tailwind is considered to exist whenever the surface wind exceeds an angle of 90 degrees to the runway in use, thus adding to the ground speed of an aircraft using that particular runway.

TAILWIND COMPONENT — The wind speed measured in knots at angles from 91 to 179 degrees from the runway in use which would equal the effect of a wind applied at 180 degrees to the runway in use. Components are specified in a component table for a specified permissible tailwind.

TARGET/PPS — The indication on a radar display of a primary radar return or a transponder reply.

TARGET/PPS RESOLUTION — In the application of radar separation, an action to ensure that radar targets do not touch.

TAXIWAY LIGHTS — Lights marking a taxiway.

TERMINAL AREA ENTRY FIX (also called BEDPOST) — A significant point located along the established en route structure over which an aircraft, cleared for a conventional or RNAV STAR, is required to pass prior to entering the terminal airspace.

TERMINAL CONTROL SERVICE — Control service provided to aircraft operating in the vicinity of a selected airport by:

A. a TCU;

B. a dedicated Terminal Control function (specialty/sub-unit) within an ACC;

C. an en route sector of an ACC adjacent to a terminal control unit/specialty/sub-unit to permit the transition from 3 miles radar separation to 5 miles radar separation.

TERMINAL CONTROLLER — Duty controller assigned to the terminal control position.

THRESHOLD LIGHTS — Lights placed across the ends of a runway or landing strip to indicate its usable limits.

TIME OF ACTIVATION — The time, expressed in Coordinated Universal Time (UTC), at which an aircraft departs from, or is estimated to arrive over, a specified point of activation.

TOUCH-AND-GO — A procedure in which an aircraft lands and then commences a take-off, without stopping.

TOWER RADAR AREA — An area of defined dimensions surrounding an airport within which radar service is provided.

TOWER RADAR PLAN — A plan containing the rules and procedures applicable in a Tower Radar Area.

TRACK — The projection on the earth's surface of the path of an aircraft, the direction of which path at any point is usually expressed in degrees from North (true, magnetic, or grid).

TRAFFIC ALERT AND COLLISION AVOIDANCE SYSTEM — Type of airborne collision avoidance system (ACAS) based on a family of airborne equipment that functions independently of the ground-based ATC system to detect potential conflicting aircraft that are equipped with secondary surveillance radar (SSR) transponders. There are three different versions: TCAS I provides traffic advisories; TCAS II provides traffic advisories and vertical resolution advisories; and TCAS III, when developed, will provide traffic advisories and vertical and horizontal resolution advisories.

TRAFFIC INFORMATION — Information issued to advise pilots of known or observed air traffic, which may be in such proximity to their position or intended route of flight, to warrant their attention.

TRANSITION — A published procedure used to connect the basic SID to one or more en route airways, or to connect one or more en route airways to the basic STAR. More than one transition may be published in the associated SID/STAR.

TRANSPONDER — The SSR receiver/transmitter installed in an aircraft.

UNINTERRUPTIBLE POWER SUPPLY — A power system that is not subjected to any interruption when a break occurs in the normal power supply.

URGENT PIREP — A pilot report containing weather information significant to the safety of flight. An urgent PIREP includes information on the following:

D. volcanic ash;
E. tornado, funnel cloud, waterspout;
F. severe turbulence;
G. severe icing;
H. hail;
I. low-level wind shear; and
J. any other reported weather phenomena considered to be hazardous or potentially hazardous to flight operations.

VECTOR —

A. A heading issued to an aircraft, for the purpose of providing navigational guidance by means of radar.
B. To issue headings to an aircraft, for the purpose of providing navigational guidance by means of radar.

VERTICAL SEPARATION — The vertical spacing of aircraft.

VFR AIRCRAFT — An aircraft operating in accordance with the visual flight rules.

VFR FLIGHT — A flight conducted in accordance with the visual flight rules.

VISIBILITY — The distance at which prominent unlighted objects may be identified by day and prominent lighted objects may be identified by night.

VISUAL APPROACH — A procedure wherein an aircraft on an IFR flight plan, operating in VFR weather conditions under the control of an air traffic control facility and having an air traffic control authorization, may proceed to the airport of destination in Visual Meteorological Conditions.

VISUAL FLIGHT RULES (VFR) — Rules that govern the procedures for conducting flight under visual meteorological conditions.

VISUAL METEOROLOGICAL CONDITIONS — Meteorological conditions, expressed in terms of visibility, and distance from cloud, equal to or greater than the minima.

VISUAL SEPARATION — A means employed by controllers to separate aircraft operating in VMC.

A. VFR — The controller having determined that a potential conflict exists, issues clearances, instructions or information, as necessary in order to either aid aircraft in establishing visual contact with each other or to assist aircraft in avoiding other aircraft.

B. IFR or CVFR — Following a pilot's report that the traffic is in sight, the controller issues the clearance and instructs the aircraft to provide its own separation by manoeuvring the aircraft as necessary to avoid or follow the traffic.

WAKE TURBULENCE — The turbulent air behind an aircraft caused by any of the following:

A. Wing-tip vortices.

B. Rotor-tip vortices.
C. Jet-engine thrust stream.
D. Rotor downwash.
E. Prop wash.

WAYPOINT - A specified geographical location, defined by longitude and latitude used for defining routes, terminal segments, and progress reporting purposes.

WET RUNWAY — A wet runway is covered with sufficient moisture to cause it to be reflective, but is not "contaminated".

WIND DIRECTION INDICATOR — The actuated device to indicate visually to aircraft the direction of the surface wind.

WIND SHEAR — Change in wind speed and/ or wind direction in a short distance. It can exist in a horizontal or vertical direction and occasionally in both.

ABBREVIATIONS

ACA	Arctic Control Area
ACAS	Airborne Collision Avoidance System
ACC	Area Control Centre
ADC	Air Defence Command
ADCUS	Advise Customs
ADF	Automatic Direction Finding Equipment
ADIS	Automated Data Interchange System
ADIZ	Air Defence Identification Zone
ADMIS	Aircraft Departing with Minimum Separation (minutes)
AFF	Aircraft Fire Fighting
AFTN	Aeronautical Fixed Telecommunications Network
AGDL	Air-Ground Datalink
AGL	Above Ground Level
A.I.P.	Aeronautical Information Publication
AIRFL	Air Refuelling
ALSF2	High Intensity Approach Lighting System Category II configuration with RAIL
ALTRV	Altitude Reservation
ALTRV	APVLAltitude Reservation Approval
AMA	Area Minimum Altitude
AMIS	Aircraft Movement Information Service
AMSCR	Aircraft Movement Surface Condition Report
AOR	Area of Responsibility
APREQ	Approval Request
APVL	Approval
ARE	Altitude Reservations East
ARTCC	Air Route Traffic Control Center
ARW	Altitude Reservations West
ASDE	Airport Surface Detection Equipment
ASL	Above Sea Level
ATC	Air Traffic Control
ATC MANOPS	Air Traffic Control Manual of Operations
ATIS	Automatic Terminal Information Service
ATS	Air Traffic Services
AVANA	Approval Void if Aircraft Not Airborne by (time)
AWY	Airway
BDRY	Boundary
CADORS	Civil Aviation Daily Occurrence Reporting System
CAVOK	Ceiling and Visibility OK (See Definition)

CCT	Circuit
CELNAV	Celestial Navigation Training
CIRVIS	Communication Instructions for Reporting Vital Intelligence Sightings
CIV	Civil
CJS	Controller Jurisdiction Symbol
CST	Coast
CTA	Control Area
CVFR	Controlled VFR
DAH	Designated Airspace Handbook
DC	Dangerous Cargo
DCPC	Direct Controller-Pilot Communication
DEF	Discrete Emergency Frequency
DF	Direction Finding
DME	Distance Measuring Equipment
DND	Department of National Defence
DSCND	Descend
DSE	Display Site Equipment
DTW	Downwind Termination Waypoint
DVFR	Defence VFR
ECC	Emergency Coordination Centre
ECM	Electronic Counter-Measures
EET	Estimated Elapsed Time
ELT	Emergency Locator Transmitter
ETA	Estimated Time of Arrival
ETD	Estimated Time of Departure
ETE	Estimated Time En Route
EXCDS	Extended Computer Display System
FACF	Final Approach Course Fix
FAF	Final Approach Fix
FIR	Flight Information Region
FL	Flight Level
FMS	Flight Management System
FP	Flight Plan
FSS	Flight Service Station
GAATS	Gander Automated Air Traffic System
GEOREF	Geographical Reference
GND	Ground
GNE	Gross Navigation Error
GPWS	Ground Proximity Warning System
HLA	High-Level Airspace
IAS	Indicated Airspeed
IATA	International Air Transport Association
IBASF	Interval Between Aircraft in Stream-Type Formation (minutes)
IBCSF	Interval Between Cells in Stream-Type Formation (minutes)
ICAO	International Civil Aviation Organization
IFPFP	Individual Flight Plan From this Point
IFR	Instrument Flight Rules
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
INS	Inertial Navigation System
IPS	Interruptible Power Supply
ISSR	Independent Secondary Surveillance Radar
IVAO	International Virtual Aviation Organization
kHz	Kilohertz
LAHSO	Land and Hold Short Operations

LLA	Low-Level Airspace
LTD	Along Track Distance
LVLOF	Level Of
MALSR	Medium Intensity Approach Lighting System with RAIL
MANOT	Missing Aircraft Notice (See Definition)
MARSA	Military Assumes Responsibility for Separation of Aircraft (See Definition)
MB	Millibars
MCP	Maintenance Control Position
MEA	Minimum En Route Altitude
MET	Meteorological or Meteorology
MHz	Megahertz
MNPS	Minimum Navigation Performance Specifications
MOA	Military Operations Area
MOCA	Minimum Obstruction Clearance Altitude
MRA	Minimum Reception Altitude
MVA	Minimum Vectoring Altitude
NADS	Northern Airspace Display System
NAR	North American Route
NAT	North Atlantic
NAVAID	Navigation Aid (See Definition)
NCA	Northern Control Area
NDB	Non-Directional Beacon
NM	Nautical Miles
NOF	International NOTAM Office
NOPAR	Do Not Pass to Air Defence Radar
NORDO	No Radio
NOZ	Normal Operating Zone
NTZ	No Transgression Zone
OAC	Oceanic Area Control Centre
OCA	Oceanic Control Area
ODALS	Omni Directional Approach Lighting Systems
OIDS	Operational Information Display System
OMNI	Omnirange
OSAF	Operational Software Adaption Facility
OSY	Open Skies Treaty designator
PADRA	Pass to Air Defence Radar
PAL	Peripheral
PAPI	Precision Approach Path Indicators
PAR	Precision Approach Radar
PARROT	Position Adjustable Range Reference Orientation Transponder
PDC	Pre-Departure Clearance
PED	Position Entry Device
PIREP	Pilot Report of Weather Conditions Encountered by Aircraft in Flight
PLN	Plan
PPI	Plan Position Indicator
PPS	Present Position Symbol
PSR	Primary Surveillance Radar
QNH	Altimeter Setting for Altitude Above Sea Level
RAIL	Runway Alignment Indicator Lights (Sequenced Flashing Lights)
RBL	Range Bearing Line

RCC	Rescue Coordination Centre
RCO	Remote Communications Outlet
RDPS	Radar Data Processing System
RNAV	Area Navigation
RNPC	Required Navigation Performance Capability
RONLY	Receiver Only
RSC	Runway Surface Condition
RSE	Radar Site Equipment
RSiT	RDPS Situation Display
RVR	Runway Visual Range
RVSM	Reduced Vertical Separation Minimum
RWY	Runway
SAOC	Sector Air Operations Control Centre
SCA	Southern Control Area
SELCAL	Selective Calling System
SID	Standard Instrument Departure
SIR	Scramble, Intercept, and Recovery
SIRO	Simultaneous Intersecting Runway Operations
SSALR	Simplified Short Approach Lighting System with RAIL
SSR	Secondary Surveillance Radar
SST	Supersonic Transport
STAR	Standard Terminal Arrival
STOL	Short Takeoff and Landing
SVFR	Special VFR
TACAN	Tactical Air Navigation Aid
TAS	True Airspeed
TAWS	Terrain Awareness and Warning System
TCAS	Traffic Alert and Collision Avoidance System
TCU	Terminal Control Unit
TRA	Tower Radar Area
TRP	Tower Radar Plan
TSB	Transportation Safety Board
TSR	Terminal Service Radar
TVOR	Terminal VOR
TWR	Control Tower
UHF	Ultra High Frequency
UPS	Uninterruptible Power Supply
UTC	Coordinated Universal Time
VASIS	Visual Approach Slope Indicator System
VDF	VHF Direction Finding System
VFR	Visual Flight Rules
VHF	Very High Frequency
VIP	Very Important Person
VMC	Visual Meteorological Conditions
VMI	Vertical Movement Indicator
VOR	VHF Omnidirectional Range
VORTAC	Collocated VOR and TACAN
VSP	Variable System Parameter
WS	Wind Shear
Z	Coordinated Universal